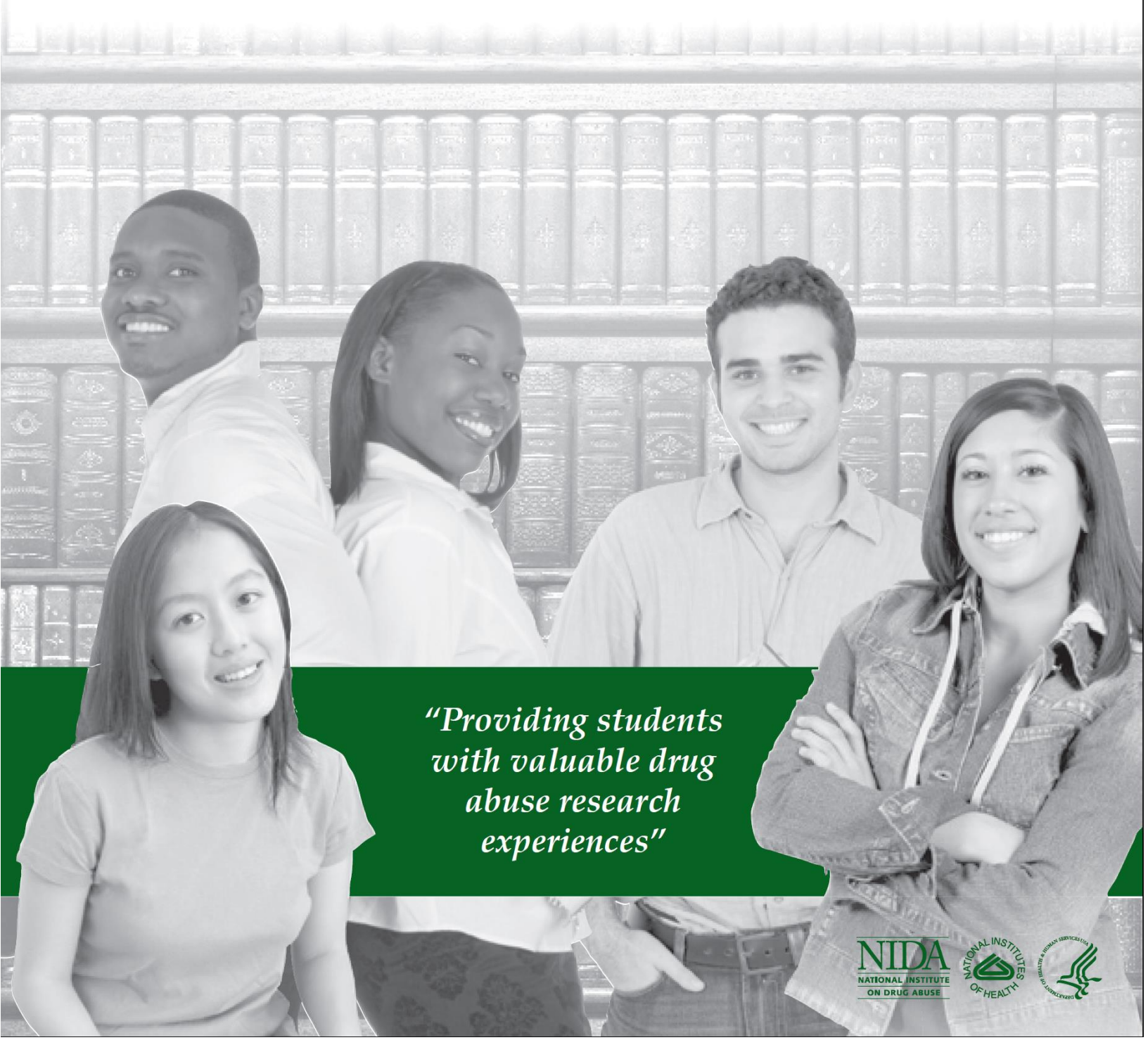


National Institute on Drug Abuse

2015 Summer Research with NIDA for Underrepresented Students



*"Providing students
with valuable drug
abuse research
experiences"*



Program

The *Summer Research with the NIDA (National Institute on Drug Abuse) for Underrepresented Students* program supports students from groups underrepresented in the sciences to pursue careers in biomedical and behavioral research. Through this program, high school and undergraduate students from underrepresented groups are introduced to the field of substance abuse and addiction research by participating in research internships with some of NIDA's most distinguished scientists at universities across the United States. Students work with leading scientist's for 8 weeks during the summer. Internship, may include laboratory experiments, data collection, data analysis, formal courses, participation in meetings, interviewing, manuscript preparation, patient recruitment, library research, and literature reviews. In addition, it is expected that at the end of the internship, each intern will deliver a formal presentation on his/her research project.

The *Summer Research with NIDA* program is in its eighteenth year. Since the program's inception in 1997, more than 815 students have gained experience in substance abuse and addiction research.

Eligibility

This program supports summer research internships for high school and undergraduate students who are from racial/ethnic groups that are nationally underrepresented in the biomedical, behavioral, and clinical sciences (African Americans, Hispanic Americans, American Indians/Alaska Natives, Hawaiian Natives, and natives of the U.S. Pacific Islands), although all racial/ethnic groups can apply.

Applicants must be at least 16 years of age and **must be U.S. citizens or permanent residents (No Exceptions).**

Individuals who have participated in the *Summer Research with NIDA* program for two summers are no longer eligible to apply.

Scope of Support

- High school students will receive stipend amounts based on the rate agreed upon with each research site, not to exceed \$10.00 per hour for a maximum stipend of \$3,200 for 8 weeks.
- Undergraduate students, including graduating high school seniors enrolled in college for the fall, will receive stipend amounts based on the rate agreed upon with each research site, not to exceed \$12.00 per hour for a maximum stipend of \$3,840 for 8 weeks.
- Please note that the research site you are matched with will set up your work schedule, method of payment, and other logistics.

Distant Sites: Only students who are 18 years old and older may be placed at sites greater than 25 miles from their permanent residence. In cases where students are placed at distant sites, investigators can request up to \$2,500 for travel, costs associated with lodging and per diem expenses for these students. In most cases, investigators/research sites will locate/secure housing for students. If lodging is available at the research site, it is indicated in the site description. On-campus housing is not available for students under 18 years old or for undergraduate students who live within daily commuting distance of their assigned internship site.

Application Procedures

To apply for this program use the online application:

<https://nidaextshare.nida.nih.gov/SRP/layouts/NIDA.SummerInternshipProgram/ApplicationForm.aspx?XsnLocation=/SRP/forms/Application.xsn>. Please review the research projects and locations listed in this brochure prior to making your final research site selections. After reviewing the research descriptions, indicate on the application form the three sites that best match your research interests and experience.

Application components include:

- an application form
- current transcripts
- two letters of recommendation

All application materials must be Submitted Friday, February 13, 2015 (No Exceptions)

Application Review & Selection

Interns are selected according to the following criteria:

- Professional goals
- Research interests
- Academics success
- Letters of recommendation
- Program priorities

Contact

For further information please contact Julie Huffman, huffmanj@mail.nih.gov, telephone: 301-443-9798.

Program Director, Albert Avila, Ph.D., aavila@nida.nih.gov.

2015 Summer Research with NIDA Site List by State



2014 Summer Research with NIDA Site List by State

State	Site Name	Project Title	Site Number	Housing Available	High School Students	Undergraduate Students
Arizona	University of Arizona	Novel Non-Peptide Opioids for Pain	1	X		X
Arkansas	University of Arkansas for Medical Sciences	A risk factor analysis of human brain states related to development addiction	2	X		X
California	Charles R. Drew University	Nicotine exacerbates high fat diet-induced hepatic steatosis and skeletal muscle abnormalities in obese mice	3	X		X
California	San Francisco Department of Public Health	An Assessment of Opioid Overdoses in San Francisco	4			X
California	Stanford University	Stanford CAM Center for Chronic Back Pain	5		X	X
California	The Scripps Research Institute	Methamphetamine and adult hippocampal neurogenesis	6		X	X
California	The Scripps Research Institute	Methamphetamine and HIV interactions in the regulation of glial activation	7			X
California	The Scripps Research Institute	Effect of Exposure to Nicotine Vapor on the Vulnerability to Nicotine Dependence	8			X
California	UCLA Center for Behavioral & Addiction Medicine	MSM & Substances Cohort at UCLA Linking Infections Noting Effects	9	X		X
California	University of California, San Francisco	Developing tools to understand the neuromodulation of hypothalamic function	10			X
California	University of California, Irvine	Role of Ventral Pallidum Projection to VTA in Reinstatement of Cocaine Seeking	11	X		X

California	University of California, Irvine	Characterization of Anandamide Transport in Brain	12			X
California	University of California, Los Angeles	Homeless Female Offenders Returning To The Community: Improving Hopeful Futures	13	X		X
California	University of California, San Francisco	RCT of an Integrative Intervention for Non-Treatment-Seeking Meth Users	14	X		X
California	University of California, San Francisco	Marketing, FDA Communications, Tobacco Perceptions and Use in Addiction Treatments	15	X		X
Connecticut	Yale School of Medicine	Three strategies for implementing motivational interviewing on medical inpatient units	16		X	X
Connecticut	Yale University	Expanding Medication-Assisted Therapies in Ukraine	17	X		X
District of Columbia	Children's National Medical Center	Development of the basal telencephalic limbic system	18		X	X
Florida	University of Florida	Transformative Approach to Reduce Research Disparities Towards Drug Users	19		X	X
Florida	Florida International University	Role of Autophagy in Microglia-induced NeuroAIDS in Substance Abuse	20			X
Florida	Florida International University	Multifunctional Nanocarrier to eradicate HIV from latently infected CNS cells and to treat drug addiction.	21			X
Florida	The Scripps Research Institute	Synthesis and Evaluation of Functionally Biased Opioid Analgesics	22	X		X
Georgia	Georgia State University	The Science of Decision Making: Connecting People to Policy	23	X		X

Hawaii	Hawaii Pacific University	The Development and Evaluation of the Ho'ouna Pono Drug Prevention Curriculum	24			X
Hawaii	University of Hawaii at Manoa	Neural Correlate of Working Memory Training in HIV Patients	25			X
Illinois	University of Illinois, Champaign	Mechanisms of amphetamine-induced plasticity in adolescents compared to adults	26			X
Illinois	Northwestern University	Multilevel Influences on HIV and Substance Use in a YMSM Cohort	27			X
Illinois	University of Chicago	Social Network Dynamics, HIV, and Risk Reduction Among Younger Black MSM	28	X		X
Iowa	University of Iowa	Isolating the Extinction Circuit for Cocaine Seeking	29	X	X	X
Kentucky	University of Kentucky	Long-lasting Cocaine-metabolizing Enzyme for Cocaine Abuse Treatment	30	X	X	X
Maryland	University of Maryland, School of Pharmacy	Development of I-THP as New Medication for Drug Addiction	31			X
Massachusetts	Boston Children's Hospital	A Real-time, Contextual Intervention using PDAs to Reduce Marijuana Use in Youth	32			X
Massachusetts	Boston Medical Center	Skin and Needle Hygiene Intervention	33			X
Massachusetts	Boston University School of Medicine	Genetic Basis of Opioid Reward and Aversion in Mice	34	X		X
Massachusetts	Boston University School of Medicine	Improving Physician Opioid Prescribing for Chronic Pain in HIV-infected Persons	35		X	X

Massachusetts	Cambridge Health Alliance & Harvard Medical School	International Latino Research Partnership	36			X
Massachusetts	McLean Hospital and Harvard Medical School	Role and Regulation of class IIa HDACs in cocaine addiction	37			X
Massachusetts	McLean Hospital and Harvard Medical School	Early Stress, Sensitive Periods and the Neurobiology of Addiction	38			X
Michigan	University of Michigan	Integrated GWAS of complex behavioral and gene expression traits in outbred rats	39			X
Michigan	University of Michigan	Visualization of Combinatorial Epigenetic Marks and Complexes in Animals	40	X	X	X
Michigan	University of Michigan	Intergenerational transmission of drug use in an urban sample	41	X		X
Missouri	Washington University	Nicotine Dependence To Smoking Cessation: Sequencing Common And Rare Variants	42	X		X
Missouri	Washington University	Policy and New Media Influences on Youth Substance Use Behaviors	43	X	X	X
Nebraska	University of Nebraska	HIV Tat & Cocaine-Mediated Induction of Astroglia: Role of ER Stress in HAND	44	X	X	X
New Hampshire	Dartmouth College	Behavioral Treatment of Adolescent Marijuana Use	45	X		X
New Jersey	Seton Hall University	Glial-Neuronal Interactions Underlying the Molecular Feedback between HIV Viral Proteins and Methamphetamine	46	X	X	X

New Mexico	University of New Mexico	Family Listening Program: Multi-Tribal Implementation and Evaluation	47		X	X
New York	New York University	Syndemic Production Among Emergent Adult Men	48	X		X
New York	Columbia University	Role For Delta Opioid Receptor In Morphine Tolerance During Chronic Pain	49		X	X
New York	Columbia University	Translational Research on Interventions for Adolescents in the Legal System	50			X
New York	Icahn School of Medicine at Mount Sinai	Substance Use/Abuse & HIV/STI Risk Behaviors in Puerto Rican Youth Growing Up	51			X
New York	Icahn School of Medicine at Mount Sinai	Neurodevelopmental effects of cannabis	52	X	X	X
New York	Icahn School of Medicine at Mount Sinai	Escalation of cocaine self-administration in mice	53			X
New York	National Development and Research institutes, Inc.	Bath Salts & the Illicit Drug Market: Use, Violence & Health Consequences	54			X
New York	New York University School of Medicine	Longitudinal Pathways to HIV Risk Behaviors Among African American and Latina Women	55			X
New York	New York University School of Medicine	Combined Cocaine and HIV Vaccine	56		X	X
New York	New York University School of Medicine	AKT Signaling at the Crossroads of Depression and Addiction	57			X
New York	Roswell Park Cancer Institute	Influence of advertising and product type on e-cigarette demand among smokers	58	X		X

New York	State University of New York at Buffalo	Substance Use in Reservists: Social and Environmental Influences	59	X		X
New York	State University of New York at Buffalo	Calcium-related Neurotoxicity of Cocaine	60	X		X
New York	University at Buffalo	Integrated GWAS of complex behavioral and gene expression traits in outbred rats	61	X	X	X
New York	Weill Cornell Medical College of Cornell University	The Role of Cav1.2 L-type Ca ²⁺ channels in cocaine-induced reinstatement	62	X		X
North Carolina	Duke University	Beta-arrestin Regulation of Ghrelin Signaling in Modulating Addictive Behavior	63	X		X
North Carolina	UNC Chapel Hill	Contributions of Glial Glutamate Transport and Transmission to Drug Abuse	64	X		X
North Carolina	UNC Wilmington	Drugs of Abuse and Memory Span	65	X	X	X
North Carolina	University of North Carolina	Cocaine Alterations of Maternal Dopamine Transients	66	X		X
North Carolina	University of North Carolina	Organismal and Genetic Networks in Drug Reward and Reinforcement	67	X		X
Oregon	University of Oregon	Siblings Reared Apart: A Naturalistic Cross-Fostering Study of Young Children	68			X
Pennsylvania	Drexel University	Modulation of Norepinephrine by Cannabinoids	69		X	X
Pennsylvania	Penn State College of Medicine	Penn State Tobacco Center of Regulatory Science	70	X		X
Pennsylvania	University of Pittsburgh	Cocaine-Induced Adaptation in NMDA Receptors	71			X
Pennsylvania	Temple University	Role of Epigenetics in Glutamate Transporter EAAT2 Regulation in Neuroaids	72			X

Pennsylvania	Temple University	Opioids, HIV/HCV and Host Cell Innate Immunity	73			X
Pennsylvania	University of Pennsylvania	Vietnam Study	74	X	X	X
Puerto Rico	University of Puerto Rico Medical Sciences Campus	Diversity-promoting Institutions Drug Abuse Research Program(DIDARP)	75			X
South Carolina	Medical University of South Carolina	Relapse to cocaine-seeking: Cellular adaptations in the VTA	76			X
Tennessee	East Tennessee State University	Nicotine and the roles of nicotinic receptors in a rodent model of schizophrenia	77	X		X
Texas	Baylor College of Medicine	Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers	78		X	X
Texas	The University of Texas Brownsville	Cannabinoid mobilization in neurons	79		X	X
Texas	The University of Texas Health Science Center at San Antonio	Relating brain maturation to impulse control and substance use development	80			X
Texas	University of Texas At El Paso	Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal	81	X		X
Texas	University of Texas Medical Branch	Inhibitors of 5-HT2CR Protein-Protein Interactions	82	X		X
Texas	University of Texas Medical Branch	Synthetic Nanofiber Vaccines for Cocaine Addiction	83	X		X
Texas	University of Texas San Antonio	The Synaptic Origin of Reward Prediction Error Signal in Dopaminergic Neurons	84		X	X

Texas	UT Southwestern Medical Center	Attenuation of Corticosteroid-Induced Hippocampal Changes	85		X	X
Utah	Utah State University	Biobehavioral Processes of Impulsivity	86			X
Virginia	George Mason University	Jail-Based Treatment to Reduce Substance Abuse, Recidivism and Risky Behavior	87	X		X
Virginia	George Mason University	In-Person Motivational Interviewing (MI) vs. a Motivational Computer Program (MC) for Probationers	88	X		X
Virginia	Virginia Tech	Development of I-THP as New Medication for Drug Addiction	89	X		X
Washington	Fred Hutchinson Cancer Research Center	Evaluating the role of alcohol and substance use on HIV transmission among MSM using viral sequence analysis	90			X
Washington	University of Washington	Mechanisms of Drug Disposition During Pregnancy	91	X		X
Wisconsin	Marquette University	Glucocorticoid regulation of dopamine clearance, cocaine seeking, and reward	92	X		X
Wisconsin	Marquette University	Glucocorticoid-regulated endocannabinoids and stress-potentiated cocaine seeking	93	X		X
Wisconsin	Medical College of Wisconsin	Mild TBI: Effects on addiction-related phenotypes and mesocorticolimbic function	94	X		X

Investigator: Victor J. Hruby, Ph.D.
Institution: University of Arizona
Tucson, AZ
Project Title: Novel Non-Peptide Opioids for Pain
Research: Drug Development Research
Research Area: Peptidomimetic Ligand Design, Peptide Mimetics Synthesis,
Molecular Pharmacy, Structure-Biological Activity Studies
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Prefer an undergraduate with experience in science, preferably chemistry, biochemistry, neuroscience or pharmacology working towards a Bachelor of Science degree. Will not be working with animals, humans and/or tissue samples.

Project Description: A good project is to work on the synthesis of novel ligands that are designed to have agonist activity at mu opioid receptors, agonist or antagonist activity at delta opioid receptors, and/or kappa opioid antagonist activity all in a single or bivalent ligand, to purify the ligands using HPLC and other methods, to determine purity and structure using HPLC, TLC, mass spectrometry and NMR. Finally, as time permits, to help determine binding affinities and efficacies.

Investigator: Clinton D. Kilts, Ph.D.
Institution: University of Arkansas for Medical Sciences
Little Rock, AR
Project Title: A risk factor analysis of human brain states
related to development of addiction
Research: Basic Research
Research Area: Individual differences, neuroimaging, cognition,
addiction risk factors, adolescence, and trauma
exposure
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Interns must have an interest in human neuroscience. Prior training in neuroscience, computer programming, or statistics is not necessary but preferred. Interns will interact with human participants and analyze data acquired from human populations, including questionnaires and neuroimaging data. Previous research experience is preferred but not required.

Project Description: The intern will be engaged in guided instruction and hands-on training related to the human drug addiction process in the Brain Imaging Research Center of the University of Arkansas for Medical Sciences. The research project will explore how variance in brain structure and brain function contributes to individual differences in trajectories of drug use disorders in at-risk adolescents. There will be opportunities to interact and learn with the medical students, graduate students, postdoctoral fellows and psychiatry residents currently participating as trainees in the UAMS NIDA T32 training program ("Translational Training in Addiction"). The intern will work with the mentor to develop a project tailored to his or her research interests.

Investigator: Theodore C. Friedman, M.D., Ph.D.
Institution: Charles R. Drew University
Los Angeles, CA
Project Title: Nicotine exacerbates high fat diet-induced hepatic steatosis and skeletal muscle abnormalities in obese mice
Research: Basic Research
Research Area: Nicotine, Smoking, Diabetes, Obesity, Hepatic steatosis, nhanes, addiction, dopamine
Earliest Start Date: 5/15/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: The following skills are preferred, but not required:

Molecular Biology skills Animal handling skills

Computer skills (excel, word, and powerpoint)

For epidemiology and literature review projects, only computer skills are needed.

Project Description: The theme of the Charles R. Drew University of Medicine and Science (CDU) Diversity-Promoting Institution Drug Abuse Research Program (DIDARP) to be “Metabolic Effects of Nicotine: It Matters.” Our training theme will continue to be “Research Teams of the Future” . We have 3 related, cross-disciplinary projects:

Project 1: Nicotine exacerbates high fat diet-induced hepatic steatosis and skeletal muscle abnormalities in obese mice.

Pilot Project A: Understanding the role of dopamine in binge-eating, nicotine and alcohol use: a translational PET study.

Pilot Project B: The association between secondhand smoking and diabetes, obesity and other chronic diseases.

Achieving these goals will eventually help reduce the health disparities as related to substance abuse.

Additional opportunities exist for clinical projects, literature review projects and epidemiology projects related to drug addiction.

All experiments are well suited for student involvement and will introduce them to major techniques in substance abuse research. Housing is available at nearby California State University-Dominguez Hills and USC students will be given the opportunity to present at our annual Drew Substance Abuse Research Day. Come enjoy a great summer in sunny Los Angeles and learn about drug addiction research.

Investigator: Phillip Coffin, M.D.
Institution: San Francisco Department of Public Health
San Francisco, CA
Project Title: An Assessment of Opioid Overdoses in San Francisco
Research: Epidemiology Research
Research Area: Opioid overdose, naloxone, geocoding
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Facility with database programs, including Excel and Access. Some experience with statistical programs - such as STATA - strongly preferred. Strong attention to detail required as this person will be working with data.

*please note there is no summer housing available; the website would not allow submission without entering a date of available housing.

Project Description: Summer intern will assist with data collection, cleaning and analysis of data sets including opioid overdose mortality from the San Francisco Medical Examiner's office, naloxone reversals from the Drug Overdose Prevention and Education Project, and emergency medical service attendance at opioid overdose events from the San Francisco Fire Department.

Investigator:	Sean Mackey, M.D., Ph.D.
Institution:	Stanford University Palo Alto, CA
Project Title:	Stanford CAM Center for Chronic Back Pain
Research:	Clinical Research
Research Area:	Chronic Pain, Back Pain, Complementary and Alternative Medicine, fMRI, CBT, MBSR, Acupuncture
Earliest State Date:	6/1/2015
Housing:	No
Student Level:	High School and Undergraduate
Minimum Age Requirement:	16

Student Qualifications: These interns will not need to have any prior research experience. All of our research is with human participants, and interns will work under the direct guidance of our trained staff. We prefer interns that are interested in working with patients, interested in chronic pain and/or chronic disease, and interested in learning about new treatments. Lastly, as we leverage technology to make our study run smoothly, and interest in computers is a slight plus.

Project Description: Stanford's CAM Center for Chronic Back Pain is a three-armed project studying three alternative (non-opioid) treatments to chronic low back pain: Real Time fMRI, MBSR/CBT (Mindfulness Based Stress Reduction and Cognitive Behavioral Therapy), and acupuncture. Summer Interns would play a vital role in participant participation in all aspect of the study. In each of the three treatment arms, as well as in the pre-treatment and post-treatment assessments, our treatment sessions are provided by a service provider and an assistant. These interns would provide this assistance, working under the direct supervision of the Clinical Psychologists, Acupuncturists, fMRI postdoctoral fellows, and Quantitative Sensory Testing administrators. By participating in the patient visits, interns will be directly involved with patient care, and will learn about a variety of alternative treatments for chronic back pain.

All interns would be under Principle Investigator Dr. Sean Mackey, MD, PhD. Interns will check-in daily with the CAM Center Manager, and will receive the same mentorship by the Pain Division Research Manager we provide to all students. The specific mentor for each intern will be selected by the interests and career goals of the intern, and is determined through start-up orientation with the Research Manager. There are three PhD's, one PhD/RN, and two clinicians working on this project, all of whom are interested in being mentors. Regardless of which mentor an intern is paired with, interns will still participate in all types of treatment (not just that provided by his/her mentor) to get maximum education and exposure.

Participation in our program will give interns a comprehensive view of the current status in the field of Pain Research. In addition to the weekly CAM center meetings, all interns will be invited to our weekly lab meetings, and our monthly Research Staff meetings. These opportunities allow interns to learn about all of the projects in Stanford's Pain Division, and to learn about research strategies used in various types of clinical trials and scientific studies.

Investigator: Chitra Mandyam, Ph.D.
Institution: The Scripps Research Institute
San Diego, CA
Project Title: Methamphetamine and adult hippocampal neurogenesis
Research: Basic Research
Research Area: Neural stem cells, learning and memory, addiction, behavior, reward
Earliest Start Date: 6/15/2015
Housing Available: No
Student Level: High School/Undergrad
Minimum Age Requirement: 16

Student Qualifications: Students majoring in Biochemistry or Neuroscience preferred. Students should have an interest in performing animal behavior such as methamphetamine self-administration, biochemical experiments including immunohistochemistry and should be interested in performing extensive microscopic analysis. Students with experience in animal handling, pipetting, tissue handling are desired.

Project Description: Neural stem cells persist in the adult hippocampal subgranular zone and mature into hippocampal granule cell neurons (a process known as hippocampal neurogenesis). Neurogenesis may play a significant role in brain repair and recovery from a number of insults. Withdrawal and relapse are integral parts of the addiction cycle, and withdrawal from methamphetamine self-administration (Meth SA) enhances reinstatement to Meth seeking. It is therefore essential to determine whether withdrawal from Meth SA alters the process of hippocampal neurogenesis via altering the structural plasticity of newly born granule cell neurons in the hippocampus. The student intern will assist the graduate student to determine whether withdrawal from Meth SA alters the dendritic arborization and spine density of newly born neurons in the granule cell layer of the hippocampus. We will use techniques such as retroviral labeling to label newly born granule cell neurons and perform 3D structural analysis on these neurons. We will use state-of-the-art software Neurolucida and NeuroExplorer from MicroBrightField to determine these issues. The overall goal of the summer internship will be to assess if withdrawal from Meth SA differentially alters the structural plasticity of newly born versus preexisting neurons in the granule cell layer in the dentate gyrus of the hippocampus. Preclinical rodent models of intravenous Meth SA will be used.

Investigator: Maria Cecilia G. Marcondes, Ph.D.
Institution: The Scripps Research Institute
La Jolla, CA
Project Title: Methamphetamine and HIV interactions in the regulation
of glial activation
Research: Basic Research
Research Area: Neuro-immunology of HIV and drug abuse
Earliest Start Date: 1/15/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Some knowledge on computers, and a little theoretical knowledge of basic immunology. The research will be on human cell lines.

Project Descriptions: We are employing a state-of-the-art ChIP-Next Gen sequence approach to identify, in human microglia and macrophage cell lines, promoters that are immediately affected by Methamphetamine and HIV Tat, which can affect inflammatory outcome and the status of the Central Nervous System as a viral reservoir. We are right now performing analysis, and the student will learn how to use bio-informatics and systems biology tools to identify target clusters and pathways, followed by validation techniques directed to a prioritized pathway of choice, with a focus on inflammation and regulation of the brain immune environment. This project is complementary to our current R01, which is focused mainly on the mechanisms related to the CCR5 promoter, in order to expand our analysis to other inflammation-relevant molecules with a translational value in the interface between HIV and drug abuse.

Investigator: Oliver George, Ph.D.
Institution: The Scripps Research Institute
La Jolla, CA
Project Title: Effect of Exposure to Nicotine Vapor on the Vulnerability to Nicotine Dependence
Research: Basic Research
Research Area: Nicotine, Addiction, Dependence, Stress, Reward
Earliest Start Date: 5/15/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Limit: 18

Student Qualifications: The research program will involve animal handling as well as brain sample processing. Ability to work with animals (rats, mice), and not being afraid to handle them is required. Proficient with excel and general computer use necessary.

Project Description: The hypothesis under test is that low to moderate levels of nicotine vapor will facilitate the acquisition of nicotine self-administration, exacerbate the effect of nicotine withdrawal, and increase the risk for relapse. Our preliminary data demonstrate that moderate to high levels of nicotine vapor exposure that lead to blood nicotine levels that are similar to electronic cigarette use increase withdrawal symptoms and facilitate the acquisition of nicotine self-administration. Our results also show that withdrawal from nicotine in dependent rats increases anxiety-like behavior and pain sensitivity. The following Specific Aims will directly test the effects of a wide range of nicotine vapor levels on these behaviors and neuroadaptations that appear to be critical for the development of and relapse to nicotine dependence.

Specific Aim 1: Test the effect of chronic exposure to nicotine vapor on anxiety-like behavior and pain. We will measure the effect of different levels of nicotine vapor exposure, ranging from second-hand to heavy electronic cigarette smoking, on anxiety-like behavior and pain sensitivity using a novel model of nicotine vapor inhalation.

Specific Aim 2: Test the effect of chronic and acute exposure to nicotine vapor on the acquisition and reinstatement of nicotine self-administration. We will measure the effect of different levels of nicotine vapor exposure, ranging from second-hand to heavy electronic cigarette smoking, on the acquisition of nicotine self-administration and relapse to nicotine seeking in rats using state-of-the-art models of escalation of nicotine self-administration in rats.

The results of these studies will (i) elucidate the behavioral effects of nicotine vapor exposure, similar to a wide range of electronic cigarette exposure, (ii) determine the minimum level of nicotine vapor exposure required to produce an increased risk for the acquisition of and relapse to nicotine dependence, and (iii) important information for nicotine dependence prevention efforts and policymakers.

Investigator:	Steven Shoptaw, Ph.D.
Institution:	UCLA Center for Behavioral & Addiction Medicine Los Angeles, CA
Project Title:	MSM & Substances Cohort at UCLA Linking Infections Noting Effects
Research:	Clinical Research
Research Area:	Clinical Trials, Medication Development, Translational Research, Methamphetamine Research
Earliest Start Date:	6/21/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Limit:	18

Student Qualifications: Candidates should have completed at least the first two years of college before the program begins. Basic knowledge of Microsoft Excel and PowerPoint required. Some familiarity with basic statistics is helpful, though training and guidance will be provided. Our work will interest those pursuing a career in a clinical field such as psychology or medicine. Students will not work with animals, but may be given experience working with human research subjects. No prior research experience is required. Students should be comfortable working with people of diverse backgrounds and discussing sensitive behavioral issues, including drug use and high-risk behaviors. Students must be able to maintain strict confidentiality of patient information.

Project Description: The UCLA Center for Behavioral & Addiction Medicine (CBAM) provides NIDA Interns with exposure to ongoing programs of addiction research including clinical trials of novel medications to treat drug dependence. Interns work closely with faculty and staff over the course of the summer to develop a deeper understanding of addiction and the various evidence-based treatment approaches available. Interns are given the opportunity to see how addiction treatment is conducted in a primary care setting versus an outpatient research clinic setting and how researchers in Los Angeles work closely with community. Interns attend lectures and presentations, conduct literature reviews, and work with research data. Interns attend regular Center meetings in order to learn the organizational structure of research and how to resolve questions and problems in carrying out study protocols. The internship includes a writing assignment and/or presentation to be completed by the end of the summer.

Investigator: Su Guo, Ph.D.
Institute: University of California, San Francisco
San Francisco, CA
Project Title: Developing tools to understand the neuromodulation of hypothalamic function
Research: Basic Research
Research Area: Neural Circuitry, Stress, Dopamine, CRF, Tool Development, Drug Abuse, Zebrafish
Housing Available: No
Earliest Start Date: 6/16/2015
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Applicants should be currently enrolled in an undergraduate institution, preferably majoring in neuroscience. S/he should have prior knowledge or training in microscopes. The research will require students to work with animals (zebrafish).

Project Description: The applicant will work with graduate students or postdocs in the lab to map out brain activity via calcium imaging, which is underlying drug- or stress-induced behaviors.

Investigator: Stephen V. Mahler, Ph.D.
Institution: University of California, Irvine
Irvine, CA
Project Title: Role of Ventral Pallidum Projection to VTA in Reinstatement of Cocaine Seeking
Research: Basic Research
Research Area: Behavioral neuroscience, addiction, cocaine, reward, drugs, motivation, DREADDs, optogenetics, channel rhodopsin, relapse, reinstatement, cues, and conditioned stimuli
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Prior research experience is preferable, especially with rat behavioral experiments, electrophysiology, immunohistochemistry, microscopy, and/or computer programming.

Project Description: Addiction is a major health concern, and its chronic relapsing nature is perhaps its most insidious aspect. Exposure to drug-associated cues is a risk factor for relapse, and understanding how the brain processes these cues may lead to addiction therapies. Here, we examine the role of projections from the ventral pallidum (VP) to ventral tegmental area (VTA) in a rat self-administration/cue-induced reinstatement model of relapse. We will employ novel, viral-based means of controlling this pathway, including designer receptors (DREADDs) that inhibit neuronal activity when an otherwise inert drug (CNO) is administered, and opsins, which allow control of neuronal activity with light. I have found that projections from the rostral portion of VP (RVP) to VTA are activated during cued reinstatement, and that DREADD-based inactivation of RVP and its VTA projections specifically block this behavior.

Here, we explore the mechanisms by which RVP-VTA projections mediate cued reinstatement, and how RVP inputs modulate VTA activity. Using a combination of immunohistochemistry (postmortem staining for neural activity and cell types), electrophysiology (recording the firing of neurons in an anesthetized rat), and virus-based strategies to control neurons (optogenetics and DREADDs), we will determine the roles of RVP projections to VTA in drug relapse. First, we will ask whether RVP inputs to VTA require dopamine in order to have effects on reinstatement behavior, using a transgenic rat line allowing expression of DREADDs specifically in dopamine neurons. Next, we will examine the temporal relationship of RVP-VTA projection activity to transient cue presentations in the reinstatement context using inhibitory optogenetic techniques. We will determine whether phasic, cue-locked activation or tonic activation of RVP inputs is necessary for conditioned stimuli to elicit reinstatement. These experiments will therefore characterize the mechanisms of the novel, functionally-identified RVP-VTA pathway, which is crucially involved in cue-induced reinstatement of cocaine seeking in a rat model of relapse in addiction.

Investigator: Danielle Piomelli, Ph.D.
Institution: University of California, Irvine
Irvine, CA
Project Title: Characterization of Anandamide Transport in Brain
Research: Basic Research
Research Area: Endocannabinoid, addiction, ventral tegmental area, nucleus accumbens, electrophysiology, liquid chromatography-mass spectroscopy
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Familiar with basic knowledge of laboratory environment, completed lower division biology and/or chemistry courses (lectures & labs), ability to work with laboratory animals such as rats and mice, collect animal tissues and work with hazardous chemicals such as methanol and chloroform. Prior research experience is preferred but not required of undergraduate students.

Project Description: The mesocorticolimbic system is comprised of the ventral tegmental area, nucleus accumbens, and medial prefrontal cortex. This brain system is responsible for processing reward and adaptive memory by attaching salience to environmental stimuli. Reward is processed by dopamine signaling arising from the ventral tegmental area. Alterations to normal dopamine signaling represent one key mechanism underlying the transition from drug use to addiction. Endocannabinoids are modulatory signals that are involved in modulation of dopamine signaling within the mesocorticolimbic system and may represent a potential therapeutic target. While existing evidence demonstrates the potential for endocannabinoids to modulate dopamine signaling at various sites within the system, there is little evidence for the direct production of endocannabinoids such as anandamide by neurons within the ventral tegmental area, nucleus accumbens, and prefrontal cortex. We hypothesize that anandamide is produced by neurons within the reward circuit which modulates dopamine signaling. Further, drugs of abuse will alter normal anandamide production at multiple sites in a synapse-specific manner, leading to an overall increase in dopamine signaling that may underlie addiction. To test these hypotheses, we will use a combination of whole-cell electrophysiology and liquid chromatography-mass spectroscopy to measure production of anandamide and other endocannabinoid signals in response to drugs of abuse in single neurons at multiple synapses within the mesocorticolimbic system. This research will elucidate the sites of endocannabinoid production within the reward system of the brain and demonstrate the importance of endocannabinoid production in normal reward processing. The results of this project will also reveal potential therapeutic targets at specific synapses within the reward circuit, allowing development of novel therapies to treat addiction. The summer intern will be involved in recording electrophysiological responses to drugs of abuse in single neurons via whole-cell electrophysiology, collection of single neurons for liquid chromatography-mass spectroscopy analysis, and data analysis.

Investigator:	Adeline Nyamathi, Ph.D.
Institution:	University of California, Los Angeles Los Angeles, CA
Project Title:	Homeless Female Offenders Returning To The Community: Improving Hopeful Futures
Research:	Clinical Research
Research Area:	Homeless Female Parolee/Probationers, health promotion, substance abuse
Earliest Start Date:	6/22/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: The students selected have demonstrated exceptional honors, academic achievements, and community volunteer activities. They are dedicated to pursuing higher education in nursing or related field and expressed an interest in a research career.

Project Description: The students will be focused on Dr. Nyamathi's current R34 "Homeless Female Offenders Returning to the Community: Improving Hopeful Futures" The research is designed to randomize 130 homeless female offenders participating in one of two residential drug treatment programs to assess the impact of a FEM-CARE or a Health Promotion control program on reduction of drug and alcohol use and recidivism. This study is based upon Dr. Nyamathi's team's history of promoting theoretically-based, culturally sensitive nurse-led interventions that are enriched with criminal justice theoretical perspectives, which have resulted in significant reductions in drug and alcohol use among homeless persons, many of whom have had a history of incarceration. The students will become involved in all aspects of research, from the administrative side of data organization, data cleaning and entry to the actual conduct of research with the homeless participants. In addition, these students will be integrated into the University Summer Minority program whereby they will get exposure to other University students and enjoy some social time together, participate in special events, and participate in a poster presentation at the end of the program.

Investigator: Adam Carrico, Ph.D.
Institution: University of California, San Francisco
San Francisco, CA
Project Title: RCT of an Integrative Intervention for Non-Treatment-Seeking Meth Users
Research: Clinical Research
Research Area: Psychoneuroimmunology; Neuroimmune pharmacology; HIV/AIDS Prevention; Lesbian, Gay, Bisexual and Transgender (LGBT) Health Disparities
Earliest Start Date: 5/26/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Although students with at least one year of research experience are preferred, no prior experience is required. Undergraduate students majoring in Nursing and Psychology are strongly encouraged to apply.

Project Description: The intern will assist with day-to-day operations at the study field site gaining experience with cleaning study data, transporting biological specimens, conducting study assessment visits, and joining meeting with our community partner (a substance abuse treatment program serving men who have sex with men). In collaboration with the study PI and postdocs, the intern will also complete a small, independently conceived research project using archival data from recently completed studies examining substance abuse treatment outcomes, LGBT disparities in substance abuse treatment outcomes, and outcomes of vocational rehabilitation for HIV-positive persons.

Investigator:	Joseph Guydish, Ph.D.
Institution:	University of California, San Francisco San Francisco, CA
Project Title:	Marketing, FDA Communications, Tobacco Perceptions and Use in Addiction Treatments
Research:	Clinical Research
Research Area:	Tobacco, FDA Regulations, Communications, Marketing, Substance Use Disorders
Earliest Start Date:	5/31/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: We are seeking undergraduate students with declared majors in psychology, sociology, or cognitive science. Preferred student research interests include substance use, nicotine dependence, and organizational behavior. Candidates who have completed an introductory statistics course are preferred. Students will participate in a summer research training program with other summer interns from across a wide variety of disciplines at UCSF. Summer interns will be expected to attend summer research seminars and participate in laboratory meetings. Students from underrepresented populations are highly encouraged to apply.

Project Description: Dr. Joseph Guydish, Professor at the University of California, San Francisco (UCSF) leads the San Francisco Treatment Research Center at UCSF. The research of his team concerns access, delivery, and organization of substance abuse treatment services, including tobacco dependence treatment services. Dr. Guydish and his team offer research opportunities for undergraduate students in the behavioral and social sciences to facilitate their successful transition to graduate research. Summer students will participate in a 10-week program and gain exposure to the application of substance abuse research methods in real world treatment settings. Research projects include a study designed to examine the use of tobacco products, marketing, messaging, and perceptions associated with those products, and their relation to tobacco use behavior in addiction treatment populations and a controlled clinical trial to evaluate the efficacy of a smoking cessation intervention for young adults delivered through Facebook. NIDA summer interns participate in UCSF Summer Research Training Program (S RTP), which consists of social and academic events with other summer interns at UCSF. The S RTP offers seminars to prepare students to become more competitive candidates for graduate education including panel discussions about the graduate school application process, life as a graduate student, and career options for researchers, as well as skill-building workshops focusing on abstract writing, oral presentation skills, and how to create effective poster presentations. Students also participate in a weekly journal club where they present a journal article relevant to their summer research project and lead a group discussion about the material, and a substance abuse seminar. Summer interns develop and conduct a research project using existing data, and present the results at the S RTP. Summer interns are also provided the opportunity to attend GRE preparation classes, if desired.

Investigator:	Kimberly Yonkers, M.D.
Institution:	Yale School of Medicine New Haven, CT
Project Title:	Three Strategies for Implementing Motivational Interviewing on Medical Inpatient Units
Research:	Clinical Research
Research Area:	Implementation, motivational interviewing, substance abuse
Earliest Start Date:	5/18/2015
Housing Available:	No
Student Level:	High School/Undergraduate
Minimum Age Requirement:	16

Student Qualifications: This project requires no prior research experience. The student would work side by side with research staff as they screen possible patient participants for a substance use disorder. The student should speak English, be available for 8 weeks during the summer and be willing to work in a non-judgmental manner with individuals who have substance use problems.

Project Description: This project seeks to compare three different methods of implementing the use of motivational interviewing on general medical inpatient units. Practitioners (physicians, physician assistants and nurses) are recruited from those who work on the general medical wards. They are given a seminar on substance abuse and how to conduct motivational interviewing and then are randomized to a seminar only, a seminar plus bedside coaching, a seminar and the ability to put in a consult. All inpatients who are cared for by randomized practitioners are screened for a substance use disorder. The research team follows practitioners and collects completed audio tapes of MI interviews that are done either by the clinician participant or consultant (in the order one condition).

Investigator: Frederick L. Altice, M.D.
Institution: Yale University
New Haven, CT
Project Title: Expanding Medication-Assisted Therapies in Ukraine
Research: Epidemiology Research
Research Area: Opioid substitution therapy, implementation science, HIV prevention, HIV treatment, methadone, buprenorphine, extended-release naltrexone, attitudes, health beliefs, operations research, qualitative research, respondent driven sampling, people who inject drugs
Earliest Start Date: 5/11/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: A broad range of data analyses are available to the student, depending on his/her skill set. We have extensive qualitative data, quantitative survey data and mixed methods options.

No humans or animals or tissue samples are needed.

Ideally should have some experience with QUALITATIVE METHODS and SOFTWARE (nVIVO, N*DIST, other) - OR - QUANTITATIVE METHODS and SOFTWARE (STATA, SAS, SPSS, R)

Project Description: Ukraine's HIV epidemic, fueled primarily among opioid-dependent people who inject drugs (PWIDs), remains volatile despite gains achieved elsewhere. PWIDs account for ~70% of cumulative and >56% of new HIV infections. Despite Ukraine's HIV epidemic transition toward a generalized epidemic, empiric and mathematical modeling suggest that medication-assisted therapy (MAT) is the most effective and cost-effective approach to reverse this trend. MAT is associated with reduced HIV transmission and improved HIV treatment outcomes including engagement in care and antiretroviral medication access and adherence. Though MAT is free and capacity has increased from 120 to ~8,000 sub sized slots since 2004, <2% of PWIDs receive it. MAT scale-up is complex, poorly understood and has been fraught with low entry and high attrition. By 2011, only ~6100 slots remain filled - a number that has not increased appreciably in 12 months. Corrective interventions that facilitate MAT entry and retention are therefore crucial for HIV prevention and treatment efforts in Ukraine. We propose to improve MAT scale-up and build regional capacity in two distinct ways. In addition to examining client- and program-level facilitators and barriers to MAT, we will train and support Ukrainian experts in implementing an evidence-based and sustainable intervention, the Network for the Improvement of Addiction Treatment (NIATx) Model of Rapid Change Cycle, to improve MAT entry and retention. We will then evaluate the impact of the NIATx approach on MAT programs across Ukraine, using a pre/post intervention design to assess programmatic changes that promote MAT entry and retention. Second, we will create a new healthcare delivery model by integrating extended release naltrexone (XR-NTX) into HIV clinical care settings as a means to increase MAT access among HIV+ PWIDs. Using implementation science techniques, we will examine both HIV (linkage to and retention in HIV care, initiation of and adherence with antiretroviral therapy) and substance abuse (time to opioid relapse, percent of days opioid free, retention on XR-NTX) treatment outcomes among an observational cohort of HIV+ PWIDs. By introducing evidence-based strategies and newly available medications that can forge new frontiers in HIV prevention and treatment, this project also builds local capacity and expertise in these innovative areas. Ukrainian HIV/AIDS programs also become better integrated and aligned with broader global health goals to improve health systems and maximize treatment capacity for multiple related and overlapping medical and psychiatric co-morbidities.

Investigator: Joshua Corbin, Ph.D.
Institution: Children's National Medical Center
Washington, DC
Project Title: Development of the basal telencephalic limbic system
Processes
Research: Basic Research
Research Area: Developmental Neuroscience and Neural Circuit Function
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Potential career research interest and/or major in as well as a strong desire to learn and participate in team science. Previous research experience not necessary, most important qualifications are a positive attitude and strong work ethic. Students may work with animal tissue, but typically not with live animals.

Project Description: Research in the Corbin lab is directed toward understanding the genetic mechanisms that govern the embryonic development of the limbic system of the brain. The limbic system of the brain regulates behaviors with emotional or social content. Altered development of this system is a hallmark feature of a variety of human disorders such as autism and addictive behaviors. Using the mouse as a model, Projects in the lab are focused on a variety of questions regarding limbic system development, function and dysfunction, and include, as examples, 1) assessment of gene alterations in genetically engineered mice lacking genes critical for brain development, 2) tracing and visualizing of neuronal connections between different brain limbic system structures and/or 3) assessment of limbic-system behaviors in genetically altered mice.

Investigator: Linda B. Cottler, Ph.D., M.P.H.
Institution: University of Florida
Gainesville, FL
Project Title: Transformative Approach to Reduce Research Disparities toward Drug Users
Research: Basic Research
Research Area: Developmental Neuroscience and Neural Circuit Function
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Seeking undergraduate students with interests in behavioral research, ethics, and/or the inclusion of underrepresented minorities in research. Students with a declared major in anthropology, psychology, sociology, social work, nursing, or other related fields are preferred. Summer students must be dedicated, reliable, curious, independent, solution-oriented, have good attention to detail, and be able to interact with members of the community.

Project Description: The Department of Epidemiology at the University of Florida has opportunities available for Summer Scholars interested in a challenging, yet rewarding, summer experience. The 2014 Summer Scholars will work on an ongoing NIDA research study entitled “Transformative Approach to Reduce Research Disparities towards Drug Users.” Summer Scholars will be involved in the third phase of this research, which involves the extension of the CTSA street-based outreach model to target people with recent illicit drug use and link them to our community-based outreach site, HealthStreet, where they can be connected with University of Florida research trials. Summer Scholars will gain experience and appreciation for the conduct of research by conducting literature reviews, participating in faculty/staff meetings, and assisting in both data collection and data analysis. More specifically, Summer Scholars will learn about the outreach protocols utilized at HealthStreet by shadowing the Community Health Workers; screen potential study participants, through HealthStreet, and link them to open studies; test our newly developed web-based HealthStreet database; and develop educational materials for various audiences designed to dispel the myths associated with enrolling individuals with a history of illicit drug use in research studies. These activities, as defined, will serve as an introduction to drug abuse research.

Investigator:	Nazira El-Hage, Ph.D.
Institution:	Florida International University Miami, FL
Project Title:	Role of Autophagy in Microglia-induced NeuroAIDS in Substance Abuse
Research:	Basic Research
Research Area:	HIV, NeuroAIDS, Drugs of abuse, Autophagy
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: The intern should be familiar with basic molecular biology and techniques such as western blotting, DNA gel electrophoresis and ELISA. In addition, intern must have knowledge in virology and life cycle of HIV. Intern must know sterile cell culture techniques and be able to grow cells (both primary and cell lines) without contamination. Intern must be willing to work with rodent.

Project Description: Approximately one-third of Human Immunodeficiency virus (HIV)-1 infected individuals develop HIV-1-associated neurocognitive disorders (HAND). Symptoms range from minor cognitive difficulties to severe neurodegenerative dementia also known as HIV-1-associated dementia (HAD). With the advent of highly active antiretroviral therapy (HAART), severe HIV-associated dementia is less common, although minor cognitive motor disorders remain an important part of infection. Microglia are macrophage-like resident immune cells in the brain that can be activated by HIV-1 infection, viral proteins, or in response to various cellular factors including secreted from infected cells. Prolonged or excessive activation of microglia produces inflammatory reactions in the brain, which are believed to be the primary cause of neuronal injury or dysfunction related to HAD pathology. Opiate drug abuse and HIV-1 are interlinked epidemics, and opiates such as heroin can exacerbate the neuro-pathogenesis of HIV-1 with a swift progression to neuroAIDS. The deleterious effects of opiates are complex and information regarding the actions of drugs of abuse on glial cell function is very limited though they are known to be critical to opiate response. Moreover, the consequent effects of the actions of drugs of abuse and the manifestation of substance abuse on neuronal function are not well known. The proposed project will investigate the role of autophagy in microglia-induced neuroAIDS and will determine the contribution of autophagy in the pathogenesis of HIV-neurodegenerative disorder in the context of opioid abuse. Macroautophagy (hereafter 'autophagy') is a multistep catabolic process, induced by numerous cellular responses including starvation, stress and pathogen, and is regulated by numerous different autophagy related genes (Atg) in which cytoplasmic material, including long-lived proteins, aggregated proteins and dysfunctional organelles, are delivered to the lysosome for degradation. Autophagy also plays a central role in the innate and adaptive immunity of many types of immune cells, including macrophages, with diverse functions such as the regulation of inflammatory responses, antigen presentation and pathogen elimination. Dysregulation of autophagy has been associated with a variety of pathological conditions including cancer, as well as cardiovascular, pulmonary and neurodegenerative diseases. The three correlated specific aims are directed at: 1) identifying a novel mechanism in the biology of microglia that regulates HIV-1 replication and whether morphine converges on HIV-1 infection through this pathway; 2) characterization at cellular levels the consequences of HIV-1 induced lysosomal dysfunction and whether prior and/ or concurrent substance abuse modifies cell function; 3) examining the signaling pathways and the significance (protective vs. toxic) of autophagy activated by HIV-1 and morphine in microglia cells and neurons. These novel findings should greatly improve our knowledge of the pathogenesis of HIV-1 resulting from substance abuse to provide insight for the design of candidate antiviral therapies targeting drug abusing individuals.

Investigator:	Madhavan Nair, Ph.D.
Institution:	Florida International University Miami, FL
Project Title:	Multifunctional Nanocarrier to Eradicate HIV from Latently Infected CNS Cells and to Treat Drug Addiction
Earliest Start Date:	6/1/2015
Housing Available:	No
Students Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: The prospect student will be an undergraduate student preferably majoring in physical or biological sciences with an expressed interest in pursuing a PhD or doctoral degree in basic or medical sciences. Students will be required to work with animals as well as tissue samples thus it is important to possess basic laboratory skills and knowledge. Students will be permitted to work only after getting appropriate training requested by the law and FIU regulations and will not work with HIV virus or infected tissues.

Project Description: The elimination of HIV reservoirs from the central nervous system (CNS) remains an extraordinary task. This is mainly due to the viral latency in the brain and the inability of antiretroviral therapy (ART) to penetrate the tightly closed blood brain barrier (BBB). It is well-known that the US has been experiencing a long-fight against the abuse of recreational drugs. Moreover, studies have shown that there is a high prevalence of HIV infection among drug users. Practice of nanotechnology in medicine has shown to be an exciting prospect for the development of a novel drug delivery system to achieve the desired therapeutic levels of anti-HIV drugs, HIV reactivating agents and drug antagonists across the BBB. Even though, a vast amount of effort has been invested in the development of nano-based drug delivery systems, they still have limitations that affect target specificity, drug delivery, drug release and bioavailability of desired amount of drug at the targeted site. Thus, from a drug delivery point of view, a fast and effective way of delivering and releasing the drugs from the carrier in the brain is needed in order to eradicate the latent HIV in the brain. The Magneto Electric Nano-Particles (MENP) is a subgroup of multiferroic materials possessing significant coupling ability of its magnetic and electric fields at body temperature. The movement of MENP can be remotely controlled for its effective penetration in the BBB by applying a weak DC current. The research project will consist in the development and evaluation of the transport, on-demand and efficacy of MENP bound to a latency breaking agent, ART and a drug antagonist across the BBB. Further, we will evaluate the in vivo efficacy of the in vitro developed nanocarrier in HIVE SCID mouse model along with a neurobehavioral modulation and observation induced by the nanoformulation in HIV SCID mouse model.

Investigator: Laura Bohn, Ph.D.
Institution: The Scripps Research Institute
Jupiter, FL
Project Title: Synthesis and Evaluation of Functionally Biased Opioid Analgesics
Research: Drug Development Research
Research Area: Opioid Receptors, morphine, reward, reinforcement, GPCR
pharmacology, ligand bias, drug discovery, mouse models, biochemistry,
cell biology, animal behavior

Earliest Start Date: 5/11/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 16

Student Qualifications: It is preferential that the student has research experience; either wet bench biochemical or animal behavior experience. Depending on their background, we could find a suitable position for them in our wide ranging approaches to drug development. Analytical skills and organized record keeping are a must. A background in coursework on Pharmacology or Biochemistry is highly desired.

Project Description: We have developed mu opioid receptor agonists that bias MOR signaling toward G protein pathways over beta-arrestin recruitment. Based on extensive work using Barrestin2-KO mice, we have hypothesized that activation of MOR without Barrestin2 recruitment will provide antinociception without side effects, including tolerance, constipation, respiratory suppression and physical dependence. We do not know whether the compounds will be more or less rewarding. These studies are beginning using mouse conditioned place preference (CPP) assays. The student would have the opportunity to take part in an active drug discovery program. We are a small efficient group of researchers (8 on the team) and the student would have the opportunity to experience firsthand how we evaluate our compounds in vitro and in vivo; they would learn how we use our findings to drive lead molecule identification and direct further chemical development.

Investigator:	Michael Eriksen, Sc.D.
Institution:	Georgia State University Atlanta, GA
Project Title:	The Science of Decision Making: Connecting People to Policy
Research:	Basic Research
Research Area:	Tobacco use, novel tobacco products, risk perceptions, decision making, point of sell, economic impact assessment, consumer behavior
Earliest Start Date:	5/25/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Qualifications and education - outstanding undergraduate student in fields relevant to regulatory science including pre-law, social sciences, economics, health promotion, public health, communications or other related fields of study. Excellent written and oral communication skills needed, and the ability to work individually as well as in teams. The student should have an interest in research, public health and tobacco control. The students will not conduct research with animals, humans or tissue samples. No prior research or experience in the field is required.

Project Description: Summer students at the GSU TCORS will have the opportunity to assist research staff working on the project entitled, "Conducting Consumer Behavior, Risk Perception and Media Research on Novel Tobacco on Products." This project includes both quantitative and qualitative research examining adults' risk perceptions about novel and alternative tobacco products, including electronic cigarettes (i.e., e-cigarettes) and little cigars/cigarillos. The findings from this research will be used to develop a prototype of a media campaign designed to accurately inform consumers about the risks associated with use of these products.

The student will have the opportunity to assist with the following tasks to support the project:

- Analysis of quantitative data from the online survey
- Analysis of qualitative data from focus groups and key informant interviews
- Development of a media campaign prototype
- Writing reports based on findings from the research
- Conducting literature reviews to support the research

The student may also have the opportunity to assist with data collection, data analysis, and/or writing to support other GSU TCORS research projects.

Investigator:	Scott K. Okamoto, Ph.D.
Institution:	Hawaii Pacific University, Honolulu, HI
Project Title:	The Development and Evaluation of the Ho'ouna Pono Drug Prevention Curriculum
Research:	Social/Behavioral Research
Research Area:	Health disparities, rural, Hawaiian youth, and prevention
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: This project requires students to work with humans only. It is appropriate for undergraduate students majoring in psychology, social work, public health, or another allied discipline. Students with knowledge and/or interest in rural, Native Hawaiian, and/or Pacific Islander youth populations are preferred. Students with skills in video editing using computer-based programs (e.g. Final Cut) are encouraged to apply.

Project Description: Building upon prior pre-prevention and pilot/feasibility prevention research, the primary goals of this project are to complete the development of the Ho'ouna Pono drug prevention curriculum and to evaluate the efficacy of the curriculum across all middle/intermediate schools on Hawai'i Island. Ho'ouna Pono is a culturally grounded drug prevention curriculum developed for rural Native Hawaiian youth. Summer Research with NIDA interns will assist in the development of the curriculum, including classroom lessons and accompanying video components. This project is appropriate for undergraduate students with interests in social/behavioral research in the area of drug prevention and health disparities. Students will collaborate with faculty and staff from multiple universities and may have opportunities to travel to Hawai'i Island for pre-production and/or filming of prevention videos.

Investigator: Linda Chang, M.D.
Institution: University of Hawaii at Manoa
Honolulu, HI
Project Title: Neural Correlate of Working Memory Training in HIV Patients
Research: Clinical Research
Research Area: Patient oriented research, neuroscience, HIV, neuroimaging
Earliest Start Date: 5/18/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: We prefer undergraduate students with some background in neuroscience or engineering. Any prior human subjects research would be preferred also.

Project Description: The student will be introduced to how clinical research is conducted. This project will involve an intervention (working memory training using Cogmed) to improve the cognitive deficits in HIV patients. Each participant in the study are assessed with detailed medical and neuropsychological assessments, as well as functional MRI, at baseline and at one-month and six-months after the Cogmed training vs. placebo training. The student will assist and gain experience in subject evaluation, data collection and data entries into the database. They will also be exposed to how functional MRI is performed and how the images are processed. Our students typically are required to work with a subset of data and learn to perform statistical analyses on the data, and present the findings to the team at the end of the internship.

Investigator:	Joshua M. Gulley, Ph.D.
Institution:	University of Illinois, Urbana-Champaign Champaign, IL
Project Title:	Mechanisms of Amphetamine-Induced Plasticity in Adolescents Compared to Adults
Research:	Basic Science
Research Area:	Mechanisms of Age of Exposure-Dependent Differences in Drug-Induced Neuroplasticity
Earliest Start Date:	5/25/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Preferred attributes include a general interest in the neuroscience of abused drugs, the effects of early life exposure to stress or stress-inducing experiences (e.g., drug exposure), adolescence, drug-induced neuroadaptation, and cognitive functioning. Majors in psychology and other neuroscience-related fields are preferred, as are students who are highly motivated, very attentive to details, and work well in a team environment.

Project Description: Dr. Gulley's laboratory studies the neurobiological and behavioral consequences of repeated exposure to psychoactive drugs such as amphetamine, cocaine and alcohol. In addition, they are interested in interventions that can enhance cognitive functioning, including nutritional supplementation. Examples of the research questions currently being addressed in the lab are: (1) Are adolescents, compared to adults, more sensitive to drug-induced changes in neural function and behavior? (2) Are there more adverse consequences when drug exposure occurs early in life and are there age-dependent differences in drug-induced neuroadaptations? (3) What are the neurobiological mechanisms that underlie individual differences in the behavioral response to drugs of abuse? (4) Can nutritional supplements serve to enhance cognition and/or delay cognitive declines associated with normal aging? Students enrolling in the summer research experience in Dr. Gulley's lab would be studying cognitive flexibility, decision making and impulsivity in rats exposed to amphetamine during adolescence or adulthood. These behavioral pharmacology studies would expose students to operant behavior techniques, pharmacological interventions, and behavioral analysis. Students would also get some exposure to *in vivo* electrophysiological techniques in freely behaving rats.

Investigator:	Brian Mustanski, Ph.D.
Institution:	Northwestern University Chicago, IL
Project Title:	Multilevel Influences on HIV and Substance Use in a YMSM Cohort
Research:	Clinical Research
Research Area:	HIV; young men who have sex with men; multilevel influence, drug, sex, and social networks; dyadic influences; substance use; STIs; mental health; viral set point; Plasma HIV sequencing
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Interest in social behavioral research, HIV, and at-risk populations such as young men who have sex with men. Good academic standing. Interest in pursuing graduate education and research in psychology, public health, or related field. Conscientious and detail orientated. Must be able to coordinate housing on their own.

Students will be required to work with human participants. Previous research experience is preferred.

Project Description: The mission of the IMPACT Program within the Department of Medical Social Sciences and Northwestern University is to conduct community-based research which improves the health and well-being of LGBTQ adolescents. The overall goal of the current project -- RADAR -- is to identify and understand the connections among sexually transmitted infections (like HIV), drug and alcohol use, and romantic or sexual relationship patterns over time among young men who have sex with men (YMSM). This cooperative agreement with the National Institute on Drug Abuse marks the first time that one study will look at drivers of new HIV infections in YMSM at multiple levels-- the genetics of the virus, effects of medications, individual behavior, sexual partner and relationship characteristics, networks, and community-level factors. Project aims are as follows: 1) Understand how co-occurring problems (or "syndemics") of substance use, HIV, sexually transmitted infections, mental disorders, and violence develop among YMSM and their partners over time; 2) Determine how relationship characteristics (or dyadic processes) influence HIV risk behaviors and transmission among YMSM; 3) Describe networks and social influences on "syndemic" development among YMSM; 4) Determine if, and how, substance use increases risk of HIV infection and the amount of HIV, or viral load, in a person's blood. We will accomplish these aims by enrolling YMSM who have participated in other IMPACT research studies. As participants develop serious partners, we will enroll those individuals to build a larger cohort of approximately 1,350 participants over the course of this five-year study. The scientific team on this grant is comprised of an interdisciplinary team of researchers, including psychologists, physicians, virologists, network scientists, and statisticians. Most are from Northwestern University, but the team also includes scientists at Oxford University and the University of Edinburgh. The Center on Halsted is a partner in the study, along with Chicago Department of Public Health and community-based organizations like Vida/SIDA. The summer intern will assist with study-related research and manuscripts. For motivated interns who have advanced skills in writing and conducting statistical analysis, authorship and co-authorship is possible. The intern will also have opportunities to meet with and learn from community-based research staff.

Investigator:	John Schneider, M.D., M.P.H.
Institution:	University of Chicago Chicago, IL
Project Title:	Social Network Dynamics, HIV, and Risk Reduction Among Younger Black MSM
Research:	Social and Behavioral Research
Research Area:	HIV, Social Network, YBMSM, MSM, Social Support, Risk, Youth
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: The NIDA summer intern should be interested in sexual health, risk behaviors (including sexual risk and substance use), health disparities, and working in low resource settings. The intern should also be comfortable facilitating activities with young people and talking about sensitive subjects related to sex and sexuality. No research experience is required; however, the intern must have experience working with African American and sexual minority youth.

Project Description: The Youth Health Leadership Corps (YHLC) is a youth-led initiative on the South Side that will empower young people to become active participants in the design and implementation of HIV and sexual health services. The YHLC will also advise unmet, critical service needs related to substance and alcohol. A team of 10 youth leaders will be trained by skilled facilitators on sexual health, substance use and risk behavior, outreach strategies, research methodology, quality improvement needs assessments, and evidence-based program planning. Upon completion of this four month training sequence, the youth will create their own quality improvement needs assessment that addresses how YBMSM access social and sexual health services in the community. Participating youth will develop a cultural competency training series for providers treating YBMSM, refine HIV and sexual health programming for all youth, and use this insight to inform existing outreach and prevention efforts for youth engaging in all types of risk behavior.

The NIDA summer intern will assist our team of youth leaders in administering the quality improvement needs assessment with other youth and clinical providers. The summer intern will also be responsible for facilitating training modules related to substance and alcohol use risk behaviors. The intern will provide feedback to youth as they create a cultural competency curriculum for case managers and health providers. He or she will also assist youth in the planning and implementation of various health outreach events held for youth of the greater South Side community.

Investigator:	Ryan LaLumiere, Ph.D.
Institution:	University of Iowa Iowa City, IA
Project Title:	Isolating the Extinction Circuit for Cocaine Seeking
Research:	Basic Research
Research Area:	Cocaine, Self-administration, Rats, Circuitry, Behavior, Prefrontal cortex
Earliest Start Date:	5/1/2015
Housing Available:	Yes
Student Level:	High School/Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: The intern does not need to have prior research experience. However, the intern must be comfortable working with rats on a daily basis. The intern should also have a strong interest in discovering the neurobiological basis of behavior, especially addiction-related behavior, and preferably an interest in pursuing a career in neuroscience.

Project Description: Our laboratory investigates the neural mechanisms underlying cocaine-seeking behavior in rats. Therefore, the research project for the summer intern will involve conducting drug self-administration experiments in rats. The rats will then undergo extinction training, followed by reinstatement testing. The reinstatement serves as a model of relapse in drug-addicted individuals. During the reinstatement testing, activity in different brain regions can be altered to determine the role of those regions in regulating this behavior. In particular, the summer intern's project will focus on the role of the infralimbic cortex in cocaine seeking. Our prior work indicates that this region is involved in the extinction of cocaine-seeking behavior. Therefore, our continuing work has focused on the precise mechanisms in this structure that underlie extinction learning. The intern's project will examine how activation and blockade of different receptors within the infralimbic cortex influence the extinction of cocaine seeking. As part of this project, the intern will be involved in stereotaxic and catheter implantation surgeries, conducting the behavioral components of the task, and engaging in the necessary histology analysis following the experiment.

Investigator:	Chang-Guo Zhan, Ph.D.
Institution:	University of Kentucky Lexington, KY
Project Title:	Long-lasting Cocaine-metabolizing Enzyme for Cocaine Abuse Treatment
Research:	Drug Development Research
Research Area:	Cocaine abuse, enzyme therapy, drug metabolism, protein therapeutics, bioengineering, and biotechnology
Earliest Start Date:	5/18/2015
Housing Available:	Yes
Student Level:	High School/Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: This project is suitable for students who have taken the General Chemistry and Biochemistry courses and is interested in drug discovery and development for drug abuse treatment.

Project Description: Cocaine abuse is a major medical and public health problem. There is still no FDA-approved medication for cocaine abuse. Disastrous medical and social consequences of cocaine abuse have made the development of an anti-cocaine medication a high priority. Enhancing cocaine metabolism by administration of human butyrylcholinesterase (BChE) is recognized as an efficient treatment strategy for cocaine overdose and addiction. However, the catalytic efficiency of wild-type BChE against the naturally occurring (-)-cocaine is low. Nevertheless, Dr. Zhan's lab has recently designed and discovered a set of BChE mutants, known as cocaine hydrolases (CocHs) with a catalytic efficiency against (-)-cocaine. Built on our previous success in rational design and discovery of the CocHs, this investigation is focused on rational design, preparation, and preclinical testing of a novel type of long-lasting CocH entities that have not only a high catalytic efficiency against (-)-cocaine, but also a long circulatory half-life in the plasma. The long-lasting CocH entity optimized in this investigation is expected to be highly effective and safe as a novel exogenous enzyme suitable for cocaine addiction treatment in humans. The research activities include rational protein design, preparation, and biological activity assays. The students will be trained to perform the studies.

Investigator: Jai Bei Wang, M.D., Ph.D.
Institution: University of Maryland, School of Pharmacy
Baltimore, MD
Project Title: Development of I-THP as New Medication for Drug Addiction
Research: Drug Development Research
Research Area: Translational research, drug development, drug addiction
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Undergraduate student with strong background in chemistry, biochemistry, Pharmacology and neurobiology, willing to work with animal or samples from animals. Prior research experience is preferred.

Project Description: The main goal of my research is to understanding neurobiology of Psychiatric disorders and to develop new and more effective therapeutic agents for these chronic diseases. Currently my lab is working on developing new drugs for drug addiction treatment or biomarkers that have potential to be used as a tool for clinical research and practice.

Investigator: Lydia Shrier, M.D., M.P.H.
Institution: Boston Children's Hospital
Boston, MA
Project Title: A Real-time, Contextual intervention using PDAs to Reduce Marijuana Use in Youth
Research: Clinical Research
Research Area: Marijuana, intervention, mobile health, adolescent, young adult
Earliest Start Date: 5/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Qualified interns will have completed high school, be comfortable with adolescents, and have experience working as part of team. Prior research experience is not required. Research will involve work with human subjects and their behavioral data.

Project Description: This project is a randomized controlled trial of a behavioral intervention ("MOMENT") to reduce marijuana use among young people who are using frequently. The intervention involved 2 sessions of in-person counseling followed by 2 weeks of self-monitoring and feedback messages via smartphone. Patients receiving primary care at Boston Children's Hospital are recruited through clinical programs. After a baseline survey and one week of smartphone data collection, participants receive either the MOMENT intervention or counseling only. They complete a survey and one week of smartphone data collection again three months after the intervention period. The summer intern will work closely with the Project Coordinator and the PI on preparing for and assisting in study visits, entering calendar data on participants' drug use, and preparing team meeting reports. The intern will be fully integrated into the team and be expected to contribute ideas and enthusiasm to the project.

Investigator:	Jane Liebschutz, M.D., M.P.H.
Institution:	Boston Medical Center Boston, MA
Project Title:	Skin and Needle Hygiene Intervention
Research:	Clinical Research
Research Area:	Addiction, Opioids, Primary Care
Earliest Start Date:	6/1/2014
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: This internship opportunity is perfect for a motivated, detail-oriented student with an interest in medicine or psychology and a background in biology or social sciences to gain hands-on clinical research experience. Students with previous experience in clinical research and/or knowledge of research methodology are preferred. Students with a strong work ethic, interest in medical research, commitment to diversity, and sense of humor are required. Graduating or rising seniors preferred, but all undergraduate levels will be considered. Underrepresented minority status is preferred per the aim of NIDA scholarship which supports this internship, but all students are welcomed to apply.

Project Description: The student will work in the Department of Medicine at Boston Medical Center as part of a \$2.67 million grant entitled “Implementing Opioid Risk Reduction Strategies into Primary Care Practice”, also called TOPCARE. The goal of this project is to implement and evaluate a new model of care aimed at decreasing the misuse of and addiction to opioids among patients with chronic pain in primary care settings. The student may also assist with activities related to the Skin and Needle Hygiene Intervention (SKIN) project, a randomized controlled trial testing a psycho-educational intervention to decrease bacterial infections among injection drug users.

TOPCARE is a five-year project including a randomized trial being implemented at 3 federally qualified health centers in the Boston area and an urban safety net hospital. During and after the 12-month intervention, the investigators will evaluate whether the intervention improved primary care physician adherence to the chronic opioid therapy guidelines and whether patients showed fewer signs of potential opioid misuse. The SKIN project is in its first year, and will be enrolling hospitalized injection drug users to offer motivational interviewing and education to improve skin and needle cleaning practices. Research assistants will interview study subjects throughout the 12 month follow up.

Summer students will help the investigators during the heart of the randomized trial for TOPCARE. Their day-to-day duties will offer opportunities for clinical exposure in primary care settings focused on underserved urban populations as well as involvement in a productive clinical research group based in primary care. They may have the opportunity to administer research interviews to patients, and support the research team in the qualitative assessment of barriers and facilitators to intervention implementation. For SKIN, students may be trained in doing research assessments of the study subjects as well as help with all aspects of the trial. Students will attend weekly research meetings with the study investigators, conduct literature reviews, participate in the preparation of articles or presentations and assist with grant proposals. There is also a curriculum for medical students and other undergraduate and graduate students conducting summer projects including opportunities to observe addiction medicine and internal medicine clinicians. There may be other projects within the department of General Internal Medicine and the Clinical Addiction Research and Education Unit for the student to become involved with as his/her time and skills allow.

Investigator: Camron Bryant, Ph.D.
Institute: Boston University School of Medicine
Boston, MA
Program Title: Genetic Basis of Opioid Reward and Aversion in Mice
Research: Basic Research
Research Area: QTL; behavioral genetics; opioid; withdrawal; reward; conditioned place preference; anxiety; elevated plus maze; RNA-seq; transcriptome; gene expression; naloxone; naltrexone; conditioned place aversion; addiction liability;
Earliest Start Date: 5/25/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Basic knowledge of molecular biology and/or some pipetting experience and/or experience in the statistical software environment are desired, but not required. Great pride in their work (no matter how large nor how small the task) and attention to detail are the key ingredients I am looking for. A career interest in psychiatric disorders be beneficial for everyone.

Project Description: The nonmedical abuse of prescription opioids is a major socioeconomic problem in the United States. Drug abuse is known to have a genetic component and epidemiological studies indicate that individuals reporting a pleasurable experience are most likely to transition to drug abuse. Accordingly, we are using closely related inbred mouse strains to rapidly map the genetic basis of opioid reward and aversion in a conditioned place preference/aversion paradigm with the mu opioid receptor agonist oxycodone and the opioid receptor antagonist naloxone. With regard to the NIDA summer student's project, robust C57BL/6 inbred strain differences in naloxone-induced conditioned place aversion has led us to rapidly pursue quantitative trait locus mapping of this trait (and other ancillary traits that also show robust strain differences, including methamphetamine-induced locomotor activity) in an F2 cross between these strains. To support this goal, the activities of the student will include video tracking and data curation for quantitative genetic analysis and training in running the R package R/qtl for various behavioral traits. Additional training includes DNA extractions and real-time quantitative PCR for measuring gene expression of candidate genes. Pending prompt animal training and protocol approval, the student could also potentially be involved in running behavioral studies in mice.

Investigator:	Jeffrey Samet, M.D., M.A., M.P.H.
Institution:	Boston University School of Medicine Boston, MA
Program Title:	Improving Physician Opioid Prescribing for Chronic Pain in HIV-infected Persons
Research:	Clinical Research
Research Area:	HIV; addiction; prescription opioid misuse; pain; opioids; clinical research; intervention; RCT;
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	High School/Undergrad
Minimum Age Requirement:	None Listed

Student Qualifications: The student should be interested in working with HIV-infected or substance using populations. Cultural sensitivity and comfort with a wide range of social, racial and ethnic populations is preferred. The student should be highly organized, detail-oriented and have exceptional communication skills. Knowledge of MS Word, PowerPoint and Excel is essential. The student intern may interact with participants and conduct screening, recruitment, and research assessments.

Project Description: The "Targeting Effective Analgesia in Clinics for HIV" (TEACH) Study will 1) test the effectiveness of a collaborative care intervention directed toward HIV physicians to improve the management of COT and 2) create and follow an observational cohort of HIV-infected patients on COT. Study start up for both aspects of the TEACH study, the collaborative care intervention and the observational cohort, will take place in summer 2015.

Among HIV-infected persons burden of chronic pain is disproportionately high, with prevalence studies suggesting 20-90% affected, even in the era of highly active antiretroviral therapies. One common pain management strategy is the use of chronic opioid therapy (COT). Studies suggest that one-fifth of all HIV-infected patients are prescribed opioids for pain. Prescription opioids are currently the most commonly abused drugs in the United States, and prescription drug overdose rates are rising in parallel with rates of opioid prescribing. A few recent studies have suggested that prescription opioid misuse/abuse may be a relatively common problem among HIV-infected patients in the United States, perhaps because of the common overlap between HIV and substance use. However, little is known about attitudes toward chronic opioid therapy among HIV-infected patients, and how receipt of chronic opioids impacts trust in providers and satisfaction with care.

The student intern will gain experience in the conduct of an active NIDA-funded randomized controlled trial. He/she will be able to observe and participate in study team conversations around research design and study implementation. The student may have the opportunity to participate in subject screening and recruitment, data collection and quality assurance activities. The intern will have weekly opportunities to shadow physicians and other expert care providers in various addiction treatment/services settings including a methadone maintenance clinic, a primary care-based opioid treatment program with buprenorphine, an HIV clinic-based substance abuse treatment program, and a needle exchange program. In addition, the student intern will participate with other summer trainees in an addiction research seminar series with general internists active in addiction research, who will discuss their area of interest, their research methods, and career paths.

Investigator: Margarita Alegria, Ph.D.
Institution: Cambridge Health Alliance & Harvard Medical School
Somerville, MA
Project Title: International Latino Research Partnership
Research: Clinical Research
Research Area: Behavioral health; mental health; substance use; HIV risk and prevention; racial/ethnic disparities.
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Excellent organizational and interpersonal skills required. BA required, preferably in the social sciences. Strong writing and typing skills are necessary. Bilingual Spanish skills are also required.

Project Description: The RA will work on a NIDA-funded study that observes substance use and HIV risk in multicultural populations. Research tasks include conducting literature searches and preparing bibliographies for scholarly papers, creating tables and graphs, entering data, etc. Responsibilities also include some administrative tasks such as general office and meeting support.

Investigator: Christopher W. Cowan, Ph.D.
Institution: McLean Hospital and Harvard Medical School
Belmont, MA
Project Title: Role and Regulation of class IIa HDACs in cocaine addiction
Research: Basic Research
Research Area: Cocaine, cocaine reward, gene regulation, epigenetics, cocaine self-administration, protein biochemistry, neuronal cultures
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: The student intern does not require prior research experience, but the project plan will likely be adjusted based on prior experience level. However, the student intern will be asked to work with rodents and rodent tissues samples. An ideal candidate might also have some prior coursework in biology, psychology, biochemistry and some basic lab course experience.

Project Description: The lab studies how drugs of abuse, like cocaine, alter the function of the brain as it related to future drug craving and drug seeking. The intern project would likely involve assisting with rodent behavioral tests that explore how an animal likes and wants to take cocaine. In addition, the project would also likely involve working with brain proteins, sectioning and analysis of brain neurons, and other related research experiences.

Investigator:	Martin Teicher, M.D., Ph.D.
Institution:	McLean Hospital and Harvard Medical School Belmont, MA
Project Title:	Early Stress, Sensitive Periods and the Neurobiology of Addiction
Research:	Clinical Research
Research Area:	Childhood maltreatment, early life stress, childhood adversity, substance use disorders, brain imaging, MRI, fMRI, cerebellum, brain reward system, neuroimaging, dopamine
Earliest Start Date:	6/2/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: A primary focus of this research experience will be on the computer-based analysis of MRI scans. Hence, students interested in working on this project should be very comfortable using computers, and interested in spending a significant amount of time in front of the computer looking at and measuring brain regions. Students will also have the opportunity to observe clinical research interviews and should be prepared to dress appropriately (e.g., no shorts, T-shirts or jeans) on those days.

Project Description: Experiencing childhood abuse and neglect increases risk for drug abuse. We have hypothesized that childhood maltreatment increases risk by altering the development of specific brain regions. We have found in prior studies that resting state blood flow in key regions implicated in drug abuse differ, on average, in maltreated individuals versus non-maltreated controls. The critical question that we hope to answer is whether differences in blood flow in these regions, which is related to under or over activity of these regions, can predict which maltreated teenagers will actually go on in the next few years to have problems with substance abuse and who will not. This summer project will focus on learning computer-based techniques for measuring blood flow in these regions of interest. Students will accompany subjects to MRI scans, and will become familiar with critical steps in processing brain scans for numerical analysis. Students will have the opportunity to sit in on clinical interviews in which exposure to childhood maltreatment and degree of drug use is ascertained using rigorously established procedures. Students will also attend weekly lab meetings where ongoing research is discussed and new research studies designed.

Investigator:	Shelly Flagel, Ph.D.
Institution:	University of Michigan Ann Arbor, MI
Project Title:	Integrated GWAS of Complex Behavioral and Gene Expression Traits in Outbred Rats
Research:	Basic Research
Research Area:	Neuropsychopharmacology, Behavioral Neuroscience, and Behavioral Genetics
Earliest Start Date:	5/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: It is desired that interns placed in our lab have previous behavioral neuroscience research experience, although not required. Interns will be conducting a number of behavioral tests with rats, assisting with surgeries, and will also be exposed to basic neuromolecular techniques. We would like students who are enthusiastic about our research topic, motivated and responsible. Ideally, we would like students who are interested in attending graduate school and in pursuing a career in academia.

Project Description: We are ultimately interested in the role incentive stimuli play in controlling drug-seeking behavior and relapse, and the neurobiological systems by which they exert their control. Specifically, our work aims to address the following questions: Why do some individuals, but not others, have difficulty resisting reward cues, including drug cues? Why do reward cues act as potent incentive stimuli, motivating and controlling behavior to a much greater degree in some individuals than others? To address these questions, we utilize a rodent model of individual differences in the extent to which cues attain incentive motivational value and gain control over behavior. Our work over the past few years indicates that there is large individual variation in the degree to which reward-related cues are attributed with incentive salience. Using a classical Pavlovian conditioning paradigm, we have shown that for some individuals, sign-trackers, a reward cue attains great incentive motivational value; whereas for others, goal-trackers, the reward cue serves merely as a predictor. Thus, sign-trackers find reward cues attractive and will approach and manipulate the cue as if it were the reward itself. In contrast, upon cue presentation, goal-trackers will immediately go to the location of reward delivery (i.e. the food cup). Thus, this animal model allows us to parse the psychological and neurobiological components underlying these distinct forms of stimulus-reward learning and will shed light on the processes that go awry in addicts. Students will gain experience in the areas of neuropsychopharmacology and classical Pavlovian learning mechanisms. The procedures routinely used in the laboratory include a number of behavioral techniques such as intravenous drug self-administration, repeated psychostimulant administration (i.e. psychomotor

Investigator: Tom Kerppola, Ph.D.
Institution: University of Michigan
Ann Arbor, MI
Project Title: Visualization of Combinatorial Epigenetic Marks and Complexes in Animals
Research: Basic Research
Research Area: Embryonic stem cells, fluorescence imaging
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: High School/Undergraduate
Minimum Age Requirement: 14

Student Qualifications: The summer student is expected to engage in their project full time during the entire period of the NIDA program. Students who have held summer internships in our laboratory in the past two years are now pursuing graduate studies at Harvard University and University of North Carolina.

Project Description: The Kerppola laboratory engages in many fields of research. Examples of research areas that a summer student can participate in include:

1. Interactions among transcription regulatory proteins mediate the combinatorial regulation of gene expression. We have developed a bimolecular fluorescence complementation (BiFC) assays for visualization of protein interactions and modifications in living cells and animals. These approaches provide the opportunity to investigate the cell-type and tissue-specificity of protein interactions and modifications in their normal cellular environments.
2. Epigenetic regulatory protein complexes maintain and control transitions between different cellular states. We have developed methods for visualization and characterization of epigenetic regulatory complex binding to chromatin in living cells. These methods provide the opportunity to investigate the mechanisms that establish and interpret the epigenetic state critical for stem cell maintenance.
3. Many cancers have complex genetic and epigenetic causes. We are pursuing new strategies for the development of therapies for rare cancers whose molecular causes have not been identified. These strategies are based on the investigation of candidate drugs that have favorable pharmacological and toxicological characteristics in animals. These strategies provide the opportunity to develop new therapies for patients who have no effective treatment options currently.

Investigator: Marc A. Zimmerman, Ph.D.
Institution: University of Michigan
Ann Arbor, MI
Project Title: Intergenerational transmission of drug use in an urban sample
Research: Epidemiology Research
Research Area: Alcohol, tobacco, and other drug use (ATOD)
Parenting style, attitudes, and behaviors
Transmission of ATOD use, coping and prosocial behaviors
Intervention development, Multilevel and longitudinal data
Earliest Start Date: 5/18/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Interns should have an interest in community-based research, childhood/adolescence, parenting behavior, or substance use behaviors. Interns will not have contact with human subjects, but will complete required human subjects/ethics training prior to joining the study. Interns should have strong writing skills and feel comfortable working/learning with others. Data analytic interest/skills are a plus, but not required. Previous research is not required.

Project Description: The study seeks to understand the intergenerational transmission of risk for alcohol, tobacco, and other drug use (ATOD) in a predominantly African-American sample, the first generation of which we have been following since 1994. Generation 1 (G1) in the proposed study includes parents of over 300 children aged 5-16 years old. The sample is unique in that the few studies on intergenerational transmission do not include a large sample of urban African-Americans with middle to low income backgrounds. The applicant will apply a socioecological developmental framework to study how familial and neighborhood environments, as well as the individual behaviors, attitudes, and experiences of a cohort of parents in middle adulthood (G1), influence parenting style, attitudes, and behaviors over time, and how these factors may influence the attitudes and behaviors of their children (G2).

The intern will assist with research implementation, data collection, analysis and, depending on experience, write-up. More specifically, the intern will be exposed to the data collection process and materials, and will assist in preparing surveys/interview protocols for the second round of data collection in fall 2015. Interns will have the opportunity to conduct guided data analyses on the first wave of data collection and will assist in data preparation and management. Interns will also contribute to preliminary reports of the findings (e.g., media announcements; results summaries) and may participate in manuscript preparation for conference or academic outlets.

Investigator:	Laura J. Bierut, M.D.
Institution:	Washington University St. Louis, MO
Project Title:	Nicotine Dependence to Smoking cessation: Sequencing Common and Rare Variants
Research:	Clinical Research
Research Area:	Return of genetic results in a smoking population
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Research will require interaction with human research participants. Students should be comfortable interacting with patients and research participants from diverse backgrounds. Previous research experience is not required.

Project Description: Twin studies have long recognized that genetic factors contribute to smoking tobacco. Our group led the first study to report a genetic association between nicotine dependence and the region surrounding the CHRNA5-CHRNA3-CHRNA4 cholinergic nicotine receptor subunit genes. Subsequently, this region has been strongly replicated in large meta-analyses and has emerged as the strongest genetic risk factor for smoking related behaviors. Studies from our group and others have also demonstrated that variation in the CHRNA6-CHRNA3 receptor subunits and nicotine metabolizing gene CYP2A6 are also associated with heavy smoking and nicotine dependence. The goal of the parent study of this summer project is to further characterize genetic findings for nicotine dependence and then to integrate how these associations contribute to smoking cessation.

Students will interview research participants who are current smokers using a standardized questionnaire that assesses personal history and history of substance use. Students will also collect saliva samples from participants for genotyping purposes. By collecting a large diverse sample of genotyped smokers, the goal of this project is to further dissect how genetic variants contribute to smoking related behaviors. The collaborative environment at Washington University will provide the opportunity to interact with researchers at a wide variety of training levels, providing diverse perspectives on substance use research.

Investigator: Patricia A. Cavazos, Ph.D.
Institution: Washington University
St. Louis, MO
Project Title: Policy and New Media Influences on Youth Substance Use Behaviors
Research: Epidemiology Research
Research Area: Psychiatry, Social Media, Policy
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: High School/Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Interest in adolescent substance behavior; Hold/plans for degree in health-related field; Ability to follow oral and written instructions; Verbal and written communication skills in English; Ability to attend to detail; Knowledge of social media platforms; Experience conducting qualitative data analysis; Experience developing and administering surveys; Ability to assist in writing scientific manuscripts; No work with animals/humans/tissue samples. Previous research experience not required.

Project Description: Deficits and other economic issues facing the federal and many state and local governments, as well as reductions in aid at all levels of social organization (i.e., school, community, and state) have occurred and are expected to continue. Initiatives that focus on preventing and treating adolescent substance use behaviors are typically prime candidates for spending cuts, which makes research on their effectiveness especially timely. An intern will help conduct a series of analyses on marijuana and alcohol programs and policies. This set of analyses will provide critical guidance for evidence-based efforts to curb adolescent substance use behaviors, and close gaps in understanding the effectiveness of key environmental strategies for reducing adolescent substance use. The intern will assist in an investigation of the processes through which school-based and state-level penalties for adolescent substance use behaviors reduce the substance use behaviors they target. He/she will examine community-level exposure to anti-marijuana/alcohol media campaigns that are designed to influence adolescent substance use behaviors. The research team will expect the intern to assist with literature reviews, as well as writing results obtained through these analyses for scientific manuscript publication.

The intern will also be involved in cutting-edge research that examines marijuana/alcohol-related chatter on Twitter. She/he will work with the research team to evaluate the chatter that encourages and discourages marijuana/alcohol use. Through this process, she/he will assist in assessing engagement, temporal trends and sentiment of these tweets. This research will position the research team to conduct a thorough social network analysis.

Investigator:	Shilpa Buch, Ph.D.
Institution:	University of Nebraska Medical Center Center Omaha, NE
Project Title:	HIV Tat & Cocaine-Mediated Induction of Astrogliosis: Role of ER Stress in HAND
Research:	Basic Research
Research Area:	HIV; Cocaine; HIV-associated Neurological Disorders (HAND); Endoplasmic Reticulum Stress (ER Stress); HIV-1 Tat; Chronic Neuroinflammation; Glial Fibrillary Acidic Protein (GFAP); Cell Signaling; Astrogliosis; Cytokines
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	16

Student Qualifications: The intern should have a demonstrated interest in science and a desire to conduct research. Good communication skills are a must. In this application the intern will not have contact with animals or tissue samples. Prior research experience is preferred but not required.

Project Description: In the current era of antiretroviral therapy, HIV-infected individuals are living longer and the incidence of HIV-associated dementia (HAD) is greatly reduced. However, increased survival rates have led to an increase in the prevalence of HIV-associated neurological disorders (HAND). Additionally, drugs of abuse including cocaine have been shown to accelerate the incidence and prevalence of HAND. Since HIV does not infect neurons, most neuroinflammation and subsequent neuronal damage results from glial cell activation including astrocytes. This summer project will examine the role of HIV viral protein tat and/or cocaine on the activation of astrocytes and whether activation is mediated via endoplasmic reticulum stress (ER Stress). Astrocyte activation will be measured by increased expression of the structural protein glial fibrillary acidic protein (GFAP) as measured by western blot from cell lysates. The intern will learn to culture both primary mouse astrocytes and the human astrocytic cell line A172. Cells will be treated with cocaine alone, HIV tat alone or HIV tat and cocaine. Furthermore, to determine if ER stress is involved, each treatment group will be pretreated with the ER stress inhibitor Salubrinal. For each treatment both a time course and a dose response will be conducted – several concentrations of each treatment will be given and the cell lysates harvested at different time points. The intern will then learn the entire process of performing western blots from making the gels to analyzing the resulting blots. Upon completion of this internship, the intern should have knowledge in cell culture technique, experimental design, harvesting cellular protein and western blot technique.

Investigator: Alan J. Budney, Ph.D.
Institution: Dartmouth College
Lebanon, New Hampshire
Project Title: Behavioral Treatment of Adolescent Marijuana Use
Research: Clinical Research
Research Area: The major goal of this project is to further develop and test innovative behavioral treatments for adolescents who abuse marijuana, and to begin to understand the mechanisms of change involved in the treatment process. Working Memory Training and Intensified Contingency Management will be evaluated in a SMART design study.
Earliest Start Date: 5/19/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Intern Qualifications include: (a) a strong interest in research and the topic area or interest in clinical behavioral research methods, (b) completion of senior year in high school and enrollment in undergraduate college, (c) strong sense of responsibility, (d) ability to communicate effectively with co-workers, (e) ability to follow directions accurately, (f) attention to detail, (g) at least 18 years of age. No previous research experience is required, but is preferred.

This position requires work with humans, and potentially with biological specimens (urine, breath, saliva). There is no contact with animals.

Project Description: Our intern will assist the existing clinical research staff with all aspects of conducting a clinical trial evaluating an outpatient treatment for adolescents with substance use problems. The project enrolls teens and families seeking treatment into one of two treatment conditions. Both involve behavioral counseling and abstinence-based incentive programs, and the experimental condition includes a computerized working memory training designed to improve executive function and help with impulsive decision making. Our intern will have the opportunity to observe interviews, assist with administering comprehensive assessments and data collection, data management, data interpretation, attend team meetings, engage in background reading, and attend seminars. Opportunities will also be available to observe and assist with other ongoing projects that use similar behavioral procedures (treatment of co-occurring marijuana and tobacco use, teen type 1 diabetes). Depending on the intern's interests, an independent project or review paper can be arranged.

Investigator:	Sulie Chang, Ph.D.
Institution:	Seton Hall University South Orange, NJ
Project Title:	Glial-neuronal interactions underlying the molecular feedback between HIV viral proteins and methamphetamine
Research:	(1) Bi-directional interaction between drug abuse and microbial infection, including HIV, in the central nervous system; (2) effects of methamphetamine and HIV-1 viral proteins on glial-neuron interactions.
Research Area:	Basic Research
Earliest Start Date:	6/15/2015
Housing Available:	Yes
Student Level:	High School/Undergraduate
Minimum Age Requirement:	16

Student Qualifications: 1) For the high school student, the preferred qualifications include science major interests and biology/chemistry teaching laboratory skills. 2) For undergraduate student, the qualifications include college level biology/chemistry teaching lab skills and declared science majors. 3) The research project will require the students to work with experimental animals and tissue samples. 4) However, the previous research lab experience is not required.

Project Description: Recently, PCR array analysis was used to show that the pro-inflammatory cytokine, IL-1 β , as well as the Ccl2, Ccl3, and Ccl7 chemokines, are increased to a greater extent in the brain of the HIV-1Tg rat compared to the F344 control rat. In addition, there is elevated dopamine D1 receptor (D1R) expression in the prefrontal cortex of HIV-1Tg rats, and that these animals have greater METH-induced behavioral sensitization, as assessed by stereotypical head movement. It has been hypothesized that the abuse of substances, such as METH, in the presence of HIV-1 viral proteins, enhances glial activation, which affects neurons, and increases the activity of the dopaminergic system, thereby increasing the intake of METH.

This study will explore the effects of METH on glial-neuronal interactions and the subsequent effects on the dopaminergic system using the HIV-1Tg rat and primary cell cultures isolated from the HIV-1Tg rat. The data from this research will shed light on possible cellular and molecular mechanisms underlying the increased abuse of substances such as METH by HIV-positive individuals, and help to elucidate the glial-neuronal interactions associated with METH abuse and neuroAIDS. The proposed studies have high clinical relevance and will contribute significantly to the understanding and treatment of neurological complications associated with substance abuse, HIV infection, and AIDS.

The 2015 summer research projects for NIDA sponsored students will engage the students to (1) examine the METH-induced behavior sensitization in HIV-1Tg rats; and (2) study gene expression in primary neurons and microglial cells isolated from the HIV-1Tg rats given METH. In addition, the students will receive an on-going training of responsible conduct of research at the Institute of NeuroImmune Pharmacology (INIP)

Investigator: Lorenda Belone, Ph.D., M.P.H.
Institution: University of New Mexico
Albuquerque, NM
Project Title: Family Listening Program: Multi-Tribal Implementation and Evaluation
Research: Community based participatory research
Research Area: American Indian families, health disparities, Native American cultural values and practices, community based participatory research approach, and intergenerational culturally-centered and evidence-based prevention program.
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 18

Student Qualifications: No previous research experience is required but must display an interest to learn.

Project Description: Successful applicants will work closely with a large university research team, led by Drs. Lorenda Belone and Nina Wallerstein and with three tribal research teams. Potential applicants must demonstrate the ability to work independently as well as collaboratively with university and community research teams. Responsibilities will be to provide assistance in the administration of the prevention program in each of the three communities (travel required) as well as to assist in the collection and analysis of process and outcome measures.

Investigator: Perry Halkitis, Ph.D.
Institution: New York University
New York, NY
Project Title: Syndemic Production Among Emergent Adult Men
Research: Basic Research
Research Area: HIV, STIs, gay & bisexual men, sexual behavior, substance use, mental health
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: CHIBPS is looking for students who are comfortable working with diverse populations and discussing sensitive topics. We are also looking for students with strong interpersonal skills and outgoing personalities. Additionally, we would like interns who have great attention to detail, respect confidentiality and have the ability to multi-task. This research requires students to work with human subjects, specifically racially/ethnically diverse gay, bisexual and other men who have sex with men.

Project Description: The Project 18 Cohort Study follows the development of syndemics among a racially/ethnically diverse group of young gay, bisexual and other men who have sex with men. Participants are asked about their sexual behavior, substance use, mental health burden and relationships; they also receive HIV and STI testing. Interns would contribute to the study by participating in community outreach to recruit new participants into the study. They would contribute to data collection by assessing participants; this involves asking them about their social networks, sexual behaviors and substance use. Interns would also screen participants for eligibility, conduct data entry and contact participants for their follow-up appointments.

Investigator:	Jose Moron-Concepcion, Ph.D.
Institution:	Columbia University New York, NY
Project Title:	Role for Delta Opioid Receptor in Morphine Tolerance during Chronic Pain
Research:	Basic Research
Research Area:	Mechanisms underlying opioid dependence, opioid analgesic tolerance during chronic pain and the interaction between chronic pain and opioid abuse
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	High School/Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: It is highly desirable that applicants have prior experience with animal research. However, if this is not the case appropriate training will be provided.

Project Description: A disturbing trend in the U.S. is the increasing non-medical use and abuse of prescription opiates. The most recent National Survey on Drug Use and Health (NSDUH) report, for example, revealed that approximately 7 million people used prescription pain relievers for non-medical purposes in 2012, and 1.9 million people were dependent on or abused prescription pain relievers. The continuing trend in the increase of non-medical use and abuse of prescription opiates (i.e. morphine) in the U.S. has resulted in increased morbidity, mortality, and economic costs at the individual, local, and national levels. Although opiates are used widely in clinical practice for the treatment of both acute and chronic pain (i.e. inflammatory pain), it is surprising that relatively few studies have examined the neural mechanisms underlying the abuse liability of commonly prescribed opiate medications during pain conditions. Pain management in opiate abusers raises many ethical and practical difficulties for clinicians, resulting in a general under-treatment of pain in this population. While chronic opiate administration may alter pain states, the presence of pain itself clearly alters the propensity to self-administer opiates. Because different variables may play an important role in the potential modulating effects of pain on the abuse liability of opiates, it is important to examine different subject populations in preclinical studies – animals with and without pain, as well as animals with and without a history of opiate abuse. Therefore, further studies conducted in animal models of opiate abuse in the presence of pain should clarify the mechanisms underlying the relationship between pain and the abuse liability of opiates.

Although it is known that opiate reinforcement is mediated through the activation of the mesolimbic dopamine neurons projecting from the ventral tegmental area (VTA) to the nucleus accumbens (NAc), there is uncertainty about the effects of pain on dopamine (DA) transmission within these brain areas and whether pain-induced effects on DA transmission within the VTA-NAc pathway may impact the rewarding and reinforcing properties of prescription opiates such as morphine. Therefore, the overall goal of the studies proposed in this application is to determine whether the presence of chronic pain modifies the patterns of prescription opiate (i.e. morphine) self-administration by decreasing the sensitivity to the drug which could precipitate drug escalation and ultimately drug overdose and whether this effect is mediated by the attenuation of the VTA-NAc pathway. These studies will be conducted both in opiate-dependent and opiate-naïve subjects with the goal to investigate how the presence of pain alters the reinforcing effects of opiates or how inflammatory pain may predispose individuals to potential dose escalation and ultimately opiate abuse.

Investigator: Gail Wasserman, Ph.D.
Institution: Columbia University
New York, NY
Project Title: Translational Research on Interventions for Adolescents in the Legal System
Research: Implementation Science Service System
Research Area: Implementation science, service system linkage, juvenile justice, substance use screening, assessment and referral, juvenile probation, data-driving decision making training, evidence-based practices
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: college graduate, interest in services research, implementation science, improving identification and service linkage for youth in contact with the juvenile justice system via training on data-driven decision making

Project Description: The burden of unmet mental health and substance use need and HIV risk among youths in the juvenile justice system is alarmingly high. A behavioral Continuum of Care approach, emphasizing coordination of services across multiple sectors of care, has promise for addressing unmet needs across these domains. Although evidence-based practices (EBPs) for identification, referral, and treatment of behavioral health problems in justice-involved youths exist, they are rarely implemented in routine practice. Based on our prior success in NYS juvenile probations, our expertise uniquely positions us to address identification and linkage, which initiates the operation of the behavioral health continuum. Compared to standard care, our earlier efforts boosted POs' use of targeted linkage practices that related, in turn, to increased service access. Here (Connect Plus) we expand earlier efforts to address substance use and HIV risk (via screening, referral practices, and interagency collaboration). We propose a multi-stakeholder Research Center to promote EBPs addressing challenges in juvenile probationers' linkage to behavioral health services. We are guided by the Comprehensive Framework for Implementation Research (CFIR) to support acceptability, feasibility, and sustainability.

Our summer intern will assist in the development/implementation of training materials for the two planned trainings that are planned for the Intervention Phase of the project. S/he will participate in scheduled workgroup conference calls and in our local research center meetings. In addition, s/he will be involved in the planned Needs Assessments for our 6 sites. During his/her internship, we will encourage him/her to attend weekly Child Psychiatry Grand Round and other routine seminars.

Investigator:	Cristiane Duarte, Ph.D., M.P.H.
Institute:	Icahn School of Medicine at Mount Sinai New York, NY
Project Title:	Substance Use/Abuse & HIV/STI Risk Behaviors in Puerto Rican Youth Growing Up
Research:	Epidemiology Research
Research Area:	Substance Abuse, Latino populations, longitudinal, Epidemiology
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Bachelor's degree (or almost finishing a Bachelor's) in psychology, anthropology, sociology, social work, behavioral science, human development, public health or a related social science field is required.

Must be fluent in Spanish (speaking, reading, and writing).

Must be available to work on evenings and weekends.

Candidate must be detail-oriented, reliable, and able to work independently under minimal supervision.

Candidate must also be a team player and demonstrate an ability to effectively interact with investigators, participants and other research assistants.

Project Description: The Boricua Youth Study (BYS) is an epidemiological research study assessing mental health in a community sample of Puerto Rican youth. The BYS collected 3 waves of data, from 2000 to 2004, that focused on antisocial behaviors and mental health outcomes of children and parents of Puerto Rican descent across two sites: South Bronx, NY (mainland) and San Juan, PR (island). BYS youth participants are now transitioning into emerging adulthood (ages 16-26), which presents a unique opportunity to understand the development of Latino youth in a critical developmental period. The fourth wave of this study aims to 1) better understand the effects of acculturation and environment on mental health outcomes and 2) understand the development of various risky behaviors (i.e. substance use/abuse, HIV/STI sexual risk behaviors, antisocial behaviors, etc.)

This internship offers the opportunity to learn about how researchers use available resources and strategies to locate and recruit study participants. Interns will have the chance to increase their knowledge and abilities of how to communicate with members of the Latino community. Interns will gain valuable research recruitment experience, under the supervision of more senior staff. They will also be involved in preparation of study materials, participant tracking and recruitment (conducting telephone calls and home visits in English and Spanish), administrative tasks, , data entry, and quality control. This position will involve contact with adolescents. In addition, other opportunities may include quality control (reviewing of interviews, storage of identifying information, and post-data collection procedures), learning new computer softwares, contributing to a growing list of resources for services available to the public, learning about the findings of previous or current waves, and access to an excellent interdisciplinary team of researchers.

Investigator: Yasmin Hurd, Ph.D.
Institution: Icahn School of Medicine at Mount Sinai
New York, NY
Project Title: Neurodevelopmental effects of cannabis
Research: Basic Research
Research Area: Marijuana, neurodevelopment, mesocorticolimbic brain regions, developmental effects of drugs, adolescent, prenatal, nucleus accumbens, prefrontal cortex, stress, depression, addiction, epigenetics, mRNA
Earliest Start Date: 6/6/2015
Housing Available: Yes
Student Level: High School/Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Qualified students usually have an interest in neuroscience, but it is not a requirement. Previous experience in research areas relevant to biochemistry, molecular biology, animal behavior or anatomy are all welcome. The research conducted in our laboratory will provide students with an opportunity to conduct behavioral work with animal (rodents) and to carry out postmortem brain studies on animal and human tissue. Although previous research experience is highly regarded, but it is not a requirement. The ability to learn quickly is important.

Project Description: Our research studies the long-term impact of developmental cannabis exposure through the use of multiple techniques. We use animal models to provide information about the causal relationship between adolescent or prenatal exposure to tetrahydrocannabinol (THC; the psychoactive component of cannabis) and behaviors in adulthood relevant to addiction and psychiatric vulnerability. We study molecular and biochemical changes in the brains of THC-exposed animals in order to identify the specific genes and brain pathways that are associated with addiction vulnerability. We use state-of-the-art techniques to study molecular mechanisms in discrete cells and their specific link to behavior in order to identify the mechanisms that maintain the long-term effects of cannabis. We also conduct translational studies in humans in order to understand the relevance of our animal work to human addiction populations.

Investigator: Paul Kenny, Ph.D.
Institute: Icahn School of Medicine at Mount Sinai
New York, NY
Project Title: Escalation of cocaine self-administration in mice
Research: Drug Development Research
Research Area: Addiction, extended access, behavior, catheterization
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Running a self-administration experiment in mice is challenging, and we require applicants to have the following skills:

- Comfortable handling animals
- Precise execution of experiments with attention to detail
- Good record keeping and observational skills
- Clean work habits

The student will be working closely with a senior postdoc who is always available for help and advice, although where appropriate independence will be encouraged. During the internship, we will focus on both the practical experimental details and the theoretical concepts in the study of addiction, and the ideal candidate has an intrinsic interest in both.

Project Description: Escalation of cocaine intake in animal models mimics loss of control over drug use in humans, which is a hallmark characteristic of addiction. Previous work has shown that extended access to cocaine self-administration in rats led to a gradual day-by-day escalation of cocaine intake. On the other hand, restricted access to cocaine self-administration led to stable cocaine intake. Considering the availability of a wide variety of genetically altered mouse-lines, it would be ideal to study escalation of cocaine intake in mice. However, in the laboratory, self-administration experiments with mice have so far not led to escalation of cocaine intake during extended access. Size, volume and pharmacokinetic differences between these two species might all contribute, and the current project is focused on finding the optimal parameters for self-administration under extended access conditions in mice, to allow for escalation of cocaine intake. Once this model is established in mice, the underlying genetics and neural circuitry of escalation can more easily be studied, in order to facilitate the development of novel medications for human addicts.

Investigator:	Elise Dunlap, Ph.D.
Institution:	National Development and Research Institutes, Inc. New York, NY
Project Title:	Bath Salts & the Illicit Drug Market: Use, Violence & Health Consequences
Research:	Social and Behavioral Science Research
Research Area:	Adverse effects; Amphetamines; behavioral health; Cathinones; Cities; Cocaine; Consumption; Designer Drugs; Drug abuse; drug market; Drug user; ecstasy; Ethnography; Focus Groups; Illicit Drugs; Ingredients and Chemicals; Legal; Life Experience; Methamphetamine; Mollies; Perception; Price; Process; public health relevance; Risk; Safety; Sales; Salts; Social Environment; Surveys; Violence
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: The student intern must be a college undergraduate who demonstrates an interest in learning about illicit drug markets, drug use and related social problems including HIV/AIDS and violence. Previous research experience is not required, but the student must have a good handle on using computers, email and software programs for Windows, and a willingness to learn new software. The student should have good writing and organizational skills and the ability to conduct library and Internet searches.

Project Description: This project is investigating the social processes involved in the sale and consumption of synthetic cathinones ("bath salts") and related illicit substances in four U.S. cities: New York, New Orleans, Houston and Galveston, Texas. The study aims to document: 1) varieties of bath salts and related substances sold on the illicit drug market, how they are sold and how they change over time; 2) how and under what circumstances violence occurs in relation to bath salts use and sales; and 3) use practices, conduct norms and health consequences associated with use. Field staff in all sites are collecting data through individual qualitative interviews, focus groups and a computer-assisted survey.

The student intern will be based in New York City, the study's home site, and will work mainly with the qualitative data. S/he will receive training in the use of FileMaker Pro, the data base management program used for qualitative data storage and analysis, and in other aspects of conducting public health research. The intern will attend biweekly staff meetings with New York field staff and project management, and with off-site field staff participating by telephone. S/he will gain hands-on experience entering data and helping project staff with quality control by listening to interview audio files and correcting transcription errors. The student intern will conduct literature reviews and will receive training in the basics of qualitative data coding and analysis to help the investigators prepare for fall presentation deadlines. The student also will be required to attend certain NDRI seminars and/or Training Institute courses, where s/he will learn about drug use, HIV/AIDS, Hepatitis C and a number of related social problems. The goal of the program is to provide both specific research skills and an overall understanding of research project components and management.

Investigator: Judith Brook, Ed.D. / Kerstin Pahl, Ph.D.
Institution: New York University School of Medicine
New York, NY
Project Title: Longitudinal Pathways to HIV Risk Behaviors Among African American and Latina Women
Research: Basic Research
Research Area: Psychosocial, Risk and protective factors, Longitudinal, Developmental, Quantitative
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Psychology or sociology major; One or more courses in research methodology; An interest in ethnic studies and research; Some experience in working on a research project.

Project Description: Our study investigates the longitudinal, developmental pathways to HIV risk behaviors in an urban sample of African American and Latina women. We will examine the integration of a number of individual, interpersonal, and environmental factors involved in HIV risk behaviors, such as depression, substance use, low parental attachment, and neighborhood/socioeconomic disadvantage, among others. We will also identify resource factors such as ethnic pride, abstinence from drug use, and social support that will offset the risks. Gender and power issues will be explored as they apply to HIV risk behaviors among women of color. The participants consist of 450 women in their 30's who were previously interviewed at four points in time in adolescence, emerging adulthood, and young adulthood. The intern will be introduced to and participate in a number of research activities, including data collection, data management, statistical techniques, developing hypotheses, conducting literature reviews, and preparing research articles for publication.

Investigator: Timothy Cardozo, M.D., Ph.D.
Institution: New York University School of Medicine
New York, NY
Project Title: Combined Cocaine and HIV Vaccine
Research: Drug Development Research
Research Area: Anti-addiction and anti-HIV vaccine development
Earliest Start Date: 5/4/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 16

Student Qualifications: The student should have taken high school chemistry and biology. The student should have used computers such as Mac or Windows based laptops daily to do their high school homework. The student should have their own email address that they are currently using daily for easy contact during the internship. Other than this, no prior experience is required.

Project Description: The summer intern will learn and be responsible for conjugation chemistry experiments. This is an experimental method whereby small molecules like drugs are attached to proteins. This is a chemistry process called conjugation. The internship consists of a training phase for 2 weeks during which the student will attend classroom lectures on basic chemistry (periodic table, electrons, etc) and basic biochemistry (amino acids and proteins). During the training phase, the student will also pursue a computer tutorial on molecular modeling on their own, and perform basic exercises in the laboratory such as making solutions, learning safety procedures etc. The general and specific project will also be described to the student during the training period. After the training period, the student will perform design and analysis experiments on the computer, and will perform conjugation chemistry experiments at the lab bench. Throughout the internship, the student will be asked to present their project in both written and oral form. During the last week of the internship, the student will present their results formally in the weekly lab meeting.

Investigator: Thomas Franke, M.D., Ph.D.
Institution: New York University School of Medicine
New York, NY
Project Title: AKT Signaling at the Crossroads of Depression and Addiction
Research: Basic Research
Research Area: Drug addiction, stress, dopamine neurons, intracellular kinase signaling, rodent behavioral models, biochemistry
Earliest Start Date: 7/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: This project will be most suited for student with previous research experience in biochemistry and/or neuroscience. The project involves the behavioral characterization of wild-type and mutant mice exposed to stress and drugs of addiction, and requires the prospective student to perform behavioral and biochemical experiments on mice.

Project Description: Drug addiction is a significant but preventable health concern; however, once the addiction process has been initiated, reversing it is difficult. Understanding the biological substrates of addiction is therefore of critical importance. This project is focused on the Akt kinase intracellular signaling pathway and builds on biochemical and genetic findings of impaired AKT1 signaling in neuropsychiatric disorders with high comorbidity for addiction. To model impaired Akt signaling, the lab studies genetically-modified models of altered Akt1 signaling in the mouse brain with an emphasis on examining if genetic deficiency is a risk and facilitating factor to augment addiction-related behaviors following exposure to social stress.

Investigator: Richard J. O'Connor, Ph.D.
Institution: Roswell Park Cancer Institute
Buffalo, NY
Project Title: Influence of advertising and product type on e-cigarette demand among smokers
Research: Epidemiology Research
Research Area: Behavior; Tobacco; Perception
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 14

Student Qualifications: A major or substantial coursework beyond the introductory level in the social or behavioral sciences (e.g., psychology, sociology, economics, communications, marketing) is required. Prior exposure to statistical analysis techniques and software is helpful.

Project Description: This project employs experimental auction methods to study consumer demand for newly emergent electronic nicotine delivery systems (ENDS, commonly called e-cigarettes). We plan to examine the impact of viewing ads for the products, as well as track participant use of any products obtained in the auction for up to six months. This novel extension will provide insights into the product adoption process. Interns will have the opportunity to assist with data analysis, and may have the opportunity to prepare and present a poster or oral paper.

Investigator:	Gregory Homish, Ph.D.
Institution:	State University of New York at Buffalo Buffalo, NY
Project Title:	Substance Use in Reservists: Social and Environmental Influences
Research:	Epidemiology Research
Research Area:	Nonmedical use of prescription drugs; tobacco; alcohol; stress; trauma; PTSD; depression; intimate partner violence; marital functioning
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Students should be pursuing an undergraduate degree in a health related or social sciences field (e.g., public health, premedicine, and psychology). Students should be interested in research related to mental health (e.g., depression, PTSD, anxiety, trauma) and health behaviors (e.g., substance use, aggression) among adults. Ideally, students should also be interested in social networks (e.g., families, friend/peers). Students should have the ability to work well in teams and have excellent attention to detail.

Project Description: This project will consider individual-level risk factors and the influence of social (e.g., partner/peer behaviors) and environmental (e.g., life stress) factors on changes in substance use in US Reserve Soldiers. Substance abuse is the most common health problem among veterans and substance use is linked to trauma, either in combat or at home. These issues are of heightened concern among the Reserve as they have more drinking problems and more interpersonal conflict relative to active duty soldiers post-deployment. With more than half of the Military currently married, it is important to examine the potential of a Reservist to influence, or be influenced, by his/her partner. Our previous research, and that of others, provides evidence that partner influences are powerful predictors of positive or negative changes in health. We also have found that peer networks are involved in changes in alcohol use among adults and that substance use shapes the peer network. Social/environmental influences may be particularly important for Reserve Soldiers and their partners as social networks change during deployments. These experiences are likely to strengthen the influence of a peer group, particularly if fellow soldiers are within one's peer networks post-deployment. Thus, the proposed study will examine within- and cross-partner influences and peer influences on the association between stress and substance use for Reserve Soldiers and their partners. Reserve Soldiers and their partners (N = 400 couples) will be assessed 3 times over 2 years (i.e. baseline, Year 1, Year 2). This project will examine: 1) changes in substance use (alcohol, tobacco, and nonmedical use of prescription drugs) over time in Reserve Soldiers and their partners on the basis of individual (e.g., depressive symptoms), relationship (e.g., partner and peer substance use), community (e.g., workplace/deployments) and societal (e.g., norms) factors; 2) the relation between stress/trauma (e.g., combat exposure/life stress) and substance use; 3) how the integration of substance use into the relationship impacts marital aggression. Importantly, each member of the couple will provide independent data. The knowledge gained from this study will enhance the development of effective treatments that address the complex issues faced by military couples; some of which could generalize to civilian couples that face similar issues.

Investigator: Congwu Du, Ph.D.
Institution: State University of New York at Stony Brook
Stony Brook, NY
Project Title: Calcium-related Neurotoxicity of Cocaine
Research: Basic Research
Research Area: Optical Neuroimaging, cerebral hemodynamic and cellular function,
Chronic cocaine, Dopamine signaling, brain connectivity
Earliest Start Date: 6/8/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Undergraduate students who are highly-motivated with research background in imaging, or experience with animal models or animal self-administration of drug are preferred

Project Description: Cocaine affects both cerebral blood vessels and neurons in the brain. Imaging technologies such as fMRI, PET, optical microscopy and near-infrared imaging have been used to assess the acute and chronic effects of cocaine. However, the mechanisms underlying cocaine's neurotoxic effects are still not fully understood, partially due to the technical limitations of current techniques to differentiate vascular from neuronal effects at sufficiently high temporal and spatial resolution. To solve this problem, we have developed a multimodal imaging platform by combining multi-wavelength laser speckle imager (MW-LSI) and optical coherence tomography (OCT). While MW-LSI provides a large FOV, high spatiotemporal resolution, and simultaneous mapping of hemodynamic, metabolic and cellular changes in responses to cocaine, OCT is capable of quantifying directional 3D CBF vascular network. The new imaging tool permits to distinguish the vascular versus the neuronal responses of the brain in response to a pharmacological challenge, thus complementing other neuroimaging modalities (e.g., PET, fMRI) for investigating brain functional changes such as those induced by drug of abuse.

Investigator: Paul Meyer, Ph.D.
Institution: University at Buffalo
Buffalo, NY
Project Title: Integrated GWAS of complex behavioral and gene expression traits in outbred rats
Research: Basic Research
Research Area: Drug addiction, Behavioral Genetics
Earliest Start Date: 5/1/2015
Housing Available: Yes
Student Level: High School/Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: High school diploma is preferred, especially with undergraduate coursework in science and biology. Students will be working with rat test subjects. No previous research is required.

Project Description: This project will study animal models of five psychological traits (sensation seeking, inattention, impulsivity, habituation, and the attribution of incentive salience) thought to underlie behavioral regulation and to be related to drug abuse. Some or all of these psychological traits are thought to predispose individuals to drug addiction. The relationship of these traits to each other and the degree to which the traits, both individually and together predict cocaine cue preference will be determined. The genetic basis of these psychological traits will be determined in conjunction with Project 4.

Specifically, we propose to phenotype 1600 male and female N/ N/NIH heterogeneous stock (HS) rats using 6 behavioral tasks. Each rat will be tested using locomotor response to novelty, light reinforcement, delay discounting, choice reaction time, Pavlovian conditioned approach, and cocaine conditioned cue preference procedures. Ten behavioral phenotypes will be derived from these tasks and used to define the five psychological traits listed above. Individual differences in the behavioral phenotypes and psychological traits will be used to perform a statistically sophisticated latent trait analysis to investigate how the behavioral phenotypes and psychological traits are related to each other and to cocaine cue preference. These data will also be used for a genome wide association study (GWAS) to determine the genetic basis of these traits (Project 4).

Upon completion of Project 3, we will have an in-depth understanding of the relationships between the behavioral phenotypes, psychological traits and cocaine conditioned cue preference. The results of the analysis, which may be different for each sex, will be reviewed with the goal of determining how well the psychological traits predict cocaine cue preference and more generally their contribution to an overall model of behavioral regulation.

Investigator:	Anjali M. Rajadhyaksha, Ph.D.
Institution:	Weill Cornell Medical College of Cornell University New York, NY
Project Title:	The Role of Cav1.2 L-type Ca ²⁺ channels in cocaine-induced reinstatement
Research:	Basic Research
Research Area:	Cocaine addiction, calcium signaling, behavior, molecular, mouse models
Earliest Start Date:	6/15/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: A highly motivated and hardworking student pursuing undergraduate studies majoring in a biology-related subject. Student should be interested in the field of drug addiction and molecular studies to understand brain mechanisms of addictive properties of drugs of abuse in preclinical mouse models. Students will conduct molecular experiments (western blots, DNA extraction and PCR, quantitative real-time PCR) using brain tissue and will also have the opportunity to work with mice. Experience with basic lab techniques through prior research lab experience or lab courses is required.

Project Description: Relapse to cocaine use is a serious public problem and represents a primary challenge that exists for the treatment of cocaine addicts. Despite extensive investigation, molecular substrates that can serve as potential therapeutic targets to prevent relapse are limited. Thus, understanding the mechanisms of relapse and identifying new molecular targets for developing pharmacological treatments will greatly aid the field of addiction research. My laboratory's research focus is to examine the role of voltage-gated Cav1.2 and Cav1.3 L-type Ca²⁺ channels and their brain signaling pathways, in the molecular and behavioral changes that result from cocaine exposure. Using preclinical mouse models, my laboratory has made great progress identifying a role for Cav1.2 and Cav1.3 channels and their signaling pathways in cocaine's addictive properties. We utilize a combination of pharmacological agents, genetic mutant mouse lines, molecular, epigenetic and behavioral techniques to address our research questions to better understand the mechanisms of cocaine addiction. Our long-term goal is to identify molecular targets for developing pharmacological treatments for cocaine addicts.

Investigator:	Lawrence Barak, M.D., Ph.D.
Institution:	Duke University Durham, NC
Project Title:	Beta-arrestin Regulation of Ghrelin Signaling in Modulating Addictive Behavior
Research:	Basic Research
Research Area:	Drug abuse, pharmacology, molecular biology, biochemistry, microscopy, G protein signaling, beta-arrestins signaling
Earliest Start Date:	5/13/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: The intern should have a basic knowledge of cell biology with an interest in molecular biology. The proposed research will involve model cell systems, and animal work is not anticipated, even though animal models are utilized.

Project Description: Drugs of abuse can interfere with the brain's dopamine reward system, leading to a model in which drug taking and drug seeking behaviors are considered pathologies of the central nervous system. When viewed in the perspective of a disease, drug abuse becomes treatable with pharmacological therapies that seek to restore dopamine signaling to normal. The endogenous hormone ghrelin, which regulates food intake, appears to be one of the strongest modulators of CNS dopamine signaling underlying reward, and thus ghrelin receptors may be prime targets for antagonizing addictive behaviors. The GHSR1a ghrelin receptor, like typical G protein coupled receptors (GPCRs), signals through two pathways, one regulated by G-proteins and the other by β -arrestin (β arr) proteins. Each signaling arm is thus a potential target for pharmacological regulation. However, the signaling events by which GHSR1a mediates the response to drugs of abuse and the relative contribution of β arr, which may be important to the modulation of dopaminergic circuit plasticity, have not been well detailed.

We believe the GHSR1a presents an outstanding pharmacological target for treating addiction and that β arr signaling will play an important role in modulating dopaminergic signaling. The summer intern will assist us in testing this hypothesis. The intern will participate in the characterization of GHSR1a signal transduction pathways using a model cell system. This will include determining the contribution β arr versus G protein to GHSR1a trafficking and signaling using molecular biology, microscopic, and biochemical techniques. Ghrelin receptor molecular determinants underlying the interaction between GHSR1a and β arrs will be modified using PCR based site directed mutagenesis. These receptor mutants will then be evaluated by a variety of secondary biologic screens using automated plate readers to measure signaling and confocal fluorescence microscopy to evaluate receptor behaviors.

These studies from a basic research perspective will help assess the importance of β arrs to ghrelin receptor regulation of reward seeking behavior; providing a framework for investigating classical ghrelin receptor ligands as well as identifying and characterizing functionally selective ones. Altogether, our studies from a clinical perspective lay crucial groundwork for the expeditious and safe pharmacological exploitation of ghrelin signaling to reduce drug use and drug-seeking behaviors.

Investigator:	Kathryn J. Reissner, Ph.D.
Institution:	University of North Carolina, Chapel Hill Chapel Hill, NC
Project Title:	Contributions of Glial Glutamate Transport and Transmission to Drug Abuse
Research:	Basic Research
Research Area:	Addiction, cocaine, astrocyte, neuron, rat, self-administration, synaptic plasticity, reinstatement, glutamate transporter, cytokine
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: No prior experience is required for this position. Some background in neuroscience is a valued plus, but is not absolutely required. An interest in a future career in biomedical research is also a plus. However, a conscientious nature is absolutely critical. The successful applicant will be responsible for daily training of rats, and some processing of brain tissue at the end of the experiment. Work with live vertebrate animals requires attention to detail and the well-being of the animal. Further, as any minor modification of procedure can have considerable impact on behavioral results, consistency and careful following of procedures is key. The intern will be trained in all techniques, including rat handling, data analysis, tissue histology, and molecular techniques.

Project Description: Our lab uses the rat self-administration model to study behaviors, neurocircuitry, and molecular pathways which contribute to cocaine addiction. In particular, we are interested in how cocaine self-administration leads to changes in neuron-astrocyte communication within the brain's reward circuitry, and how these changes in communication contribute to long-lasting drug seeking behaviors. The available summer project will be designed to investigate how cocaine abuse in this model activates cytokine activity and expression. Cytokines are signaling molecules which are typically (but not always) associated with inflammatory processes. Of relevance, a number of cytokines can suppress expression of glutamate transporter GLT-1, which is an important regulator of cocaine seeking. The summer student will learn how to perform rat surgical catheterization, how to provide post-operative monitoring and care, and how to perform and analyze self-administration behavior. The intern will also participate in measurements of cytokine expression and activity under various experimental designs, using Western blotting, immunohistochemistry, and ELISA assays. Our lab is a fun and collaborative environment where we work together toward education and advancement of knowledge in the neurobiology of addiction.

Investigator:	Mark Galizio, Ph.D.
Institution:	University of North Carolina, Wilmington Wilmington, NC
Project Title:	Drugs of Abuse and Memory Span
Research:	Basic Research
Research Area:	Behavioral pharmacology, drug effects on memory and cognition, animal models
Earliest Start Date:	5/27/2015
Housing Available:	Yes
Student Level:	High School/Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Seeking students with strong interests in psychology, biology and/or neuroscience. No prior experience is necessary but a background in psychology and neuroscience is helpful. Students should be interested in and comfortable with using laboratory rats to study the effects of drugs on memory and behavior.

Project Description: Drugs of abuse are associated with a variety of cognitive deficits including disruption of learning and memory. Animal models are needed to better assess the cognitive risks of use and abuse of psychoactive drugs. Research in our laboratory has developed new ways of studying working and episodic memory in rats using olfactory stimuli. Ongoing experiments are determining the acute effects of drugs of abuse and other selected compounds that are thought to interfere with memory using the span procedure including benzodiazepines such as flunitrazepam (roofies), NMDA antagonists (dizocilpine, ketamine), psychostimulants (methylphenidate--Ritalin, methamphetamine, MDMA--ecstasy), and an anticholinergic hallucinogen (scopolamine). These studies are increasing our understanding of the effects of drugs on working and episodic memory and are also leading to new insights into the neurochemical pathways associated with different memory processes. Students are engaged in every aspect of my research program and this summer experience will provide opportunities for students to develop research skills and increase their understanding of behavioral pharmacology and cognitive neuroscience. These experiences will include learning to train and perform behavioral tests with rats using MED State software, data collection and analysis, and readings/discussion about drug abuse and behavioral pharmacology in lab meetings.

Investigator: Donita Robinson, Ph.D.
Institution: University of North Carolina
Chapel Hill, NC
Project Title: Cocaine Alterations of Maternal Dopamine Transients
Research: Basic Research
Research Area: dopamine, cocaine, maternal, infant, reward, salience,
electrochemistry, voltammetry, accumbens, gestation
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 15

Student Qualifications: This study requires work with rats. Students who have previous experience with animals (such as pets) are preferred. Student must be able to follow directions, ask questions and work on a team to figure out how cocaine contributes to child neglect.

Project Description: The mother-infant bond is one of the strongest affiliations in humans, but it can be disrupted if the mother is addicted to cocaine. This project uses an animal model (the rat) to study how maternal cocaine exposure during pregnancy alters the mothers' response to her infants. The hypothesis is that dopamine signals in the brain are a critical part of the mother's response to her infant, and that cocaine exposure reduces dopamine signaling in the mother. Furthermore, the baby's prenatal exposure to cocaine may impair its ability to elicit maternal care from its mother, such as with effective cries and smells. The study tests these hypotheses by directly measuring dopamine release in the mother rat's brain while she interacts with her babies and while she is presented with smells and sounds produced by untreated or cocaine-treated infants. Dopamine is measured with electrochemistry, and the dopamine signals are time-locked to video recordings of the mother rat's behavior. This study is important because the ability to detect differential dopamine responses to specific infant stimuli may have clinical implications for the high incidence of maternal neglect in cocaine-using women.

Investigator:	Lisa M. Tarantino, Ph.D.
Institution:	University of North Carolina Chapel Hill, NC
Project Title:	Organismal and Genetic Networks in Drug Reward and Reinforcement
Research:	Basic Research
Research Area:	Cocaine, addiction, genetics, genomics, behavior, stress, impulsivity, dopamine
Earliest Start Date:	5/15/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Our laboratory primarily conducts basic research using animal models in the areas of neurobiology, behavior and genetics. A particular set of skills is not required, but background in animal handling and basic laboratory techniques would be helpful. However, the student could and will be trained in these areas - therefore, no previous research experience is required - just an enthusiasm for science and a desire to learn and grow! Students will be required to work with live laboratory mice.

Project Description: In humans, initial sensitivity to psychostimulants like cocaine predicts future drug use and abuse. Therefore, studying individual differences in initial drug sensitivity will advance our understanding of this predisposing factor in addiction liability. In rodent models, psychomotor stimulation in response to an acute dose of drug is often used as a model for initial sensitivity and has a significant genetic component. Moreover, initial locomotor sensitivity is often correlated with propensity to self-administer psychostimulants in operant paradigms. An inbred mouse strain that shows normal baseline locomotor activity but an exaggerated locomotor response to cocaine has been identified in our laboratory during an ongoing research project. These mice show normal acquisition of cocaine self-administration, but are highly motivated to obtain drug under a progressive ratio schedule of reinforcement. Moreover, these mice show a significantly extended response to acute stress indicating a potential link between the hypothalamic-pituitary-adrenal (HPA) axis and drug reward and reinforcement behaviors. Finally, these inbred mice show behaviors consistent with an impulsive and/or compulsive phenotype – another predisposing factor for addiction liability. The summer research project would involve further characterization of these mice in a number of additional behaviors including measures of learning and memory, impulsivity and drug reward. In addition, baseline measures of dopamine both prior to and after exposure to cocaine and stress will be obtained using fast scan cyclic voltammetry in collaboration with another laboratory on the UNC campus. The data from these experiments will aid in the characterization and development of this line of mice as a model for addiction-like behavior and lead to further phenotypic and genetic analysis.

Investigator:	Leslie Leve, Ph.D.
Institution:	University of Oregon Eugene, OR
Project Title:	Siblings Reared Apart: A Naturalistic Cross-Fostering Study of Young Children
Research:	Basic Research
Research Area:	children, parenting, siblings, genetic
Earliest Start Date:	6/15/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Students should have a basic understanding of psychological research and an interest in pursuing graduate studies in psychology or a related discipline. Must be willing to be work collaboratively as part of a team. No prior research experience is required. There may be opportunities for human subject activity, but this is not a requirement.

Project Description: In this research program, we are interested in the ways that families contribute to their children's healthy and successful development. We do this by studying the associations between aspects of child development (including peer relations, school behavior, problem behavior, and social skills) and aspects of the family (including parenting practices, marital relationships, economic resources, and substance use in the family). In this study, we are interviewing 215 families across the United States who are currently parenting a biological child who is 7 years old. We conduct telephone interviews with the parents, and will also visit families in their homes to record some of their family interactions on digital media. We also have data on the child's biological sibling, and a goal of the study is to see how similar or different the two siblings are and how any differences relate to the parenting they receive. Students involved in the summer research internship will attend weekly meetings with our research team to discuss and problem-solve issues we are having in the study, and hear information about our research findings. They will read one article a week related to the study purpose, and will review and practice the interview procedures under the mentorship of members of our research team. They will also participate in the coding team and help with literature searches. They will learn about and become familiar with the different aspects that are involved in a research study, such as IRB approval, recruitment, assessment, data management, and coding (but will not be expected to perform each of these activities). They will be given opportunities to attend research talks given on campus throughout the summer in topics related to this research program.

Investigator: Elisabeth Van Bockstaele, Ph.D.
Institution: Drexel University
Philadelphia, PA
Project Title: Modulation of norepinephrine by cannabinoids
Research: Basic Research
Research Area: Cannabinoids, Alcohol, Stress, Norepinephrine
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 16

Student Qualifications: We are looking to accommodate students eager to learn molecular and cellular techniques such as RT-PCR and western blotting. We also focus heavily on neuroanatomical techniques, and it is likely that students will have opportunities to engage in microscopy experiments as well. Students will be required to work with rodents and their brain tissues. Prior research experience is not required. Students with a strong career interest in neuroscience and some educational background in biology and chemistry are encouraged to apply.

Project Description: The norepinephrine (NE) system plays a critical role in the modulation of emotional state, arousal, and stress responses. As the sole source of NE to the medial prefrontal cortex (mPFC), the locus coeruleus (LC) regulates cognitive flexibility and arousal, affect, and decision making regarding substance abuse through modulatory effects of NE in the mPFC. Evidence from our laboratory and others suggests that alcohol and cannabinoids significantly impact the brain NE system. Alcohol and cannabis are frequently used concurrently and this polysubstance abuse is associated with heightened adverse consequences compared to the use of either substance alone. Gaps exist in our knowledge regarding specific interactions between alcohol and cannabinoids in the NE system. In addition, evidence suggests a greater negative impact of alcohol on females compared to males, suggesting that the prevalence and/or severity of polysubstance abuse may have greater negative consequences in females. Thus, the project will focus on elucidating a more in-depth understanding of the effects of alcohol and cannabinoids interactions on stress-related neural circuits across the sexes. We will test the hypothesis that exposure to alcohol intensifies cannabinoid-induced dysregulation of brain NE activity. Additionally, this project will build on our preliminary data showing a sex dependent effect of chronic alcohol exposure the endocannabinoid (EC) system in the LC, which provides a potential mechanism for over-activation of brain NE circuitry following combined alcohol and cannabinoid use in females. We will use rodents to examine our hypotheses. Techniques used to conduct this research will include RT-PCR and western blotting to examine cellular signaling components of the NE and EC systems following combined exposure to alcohol and cannabinoids in stress-related brain regions. These techniques will allow the student to study interactions between stress and drug abuse with experiments related specifically to comorbid alcohol and cannabis addiction.

Investigator: Joshua Muscat, Ph.D., M.P.H.
Institution: Penn State College of Medicine
Hershey, PA
Project Title: Penn State Tobacco Center of Regulatory Science
Research: Epidemiology Research
Research Area: Tobacco, Tobacco Regulatory Policy, Epidemiology, Genetics, Lung Cancer
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: The project will involve lab-based experiments with human tissue samples (blood and saliva) and proteins extracted from such samples. Statistical analysis following completion of experiments will also be conducted. Prior undergraduate-level coursework in the areas of biology, chemistry, and biochemistry is required. Previous research experience in addition to coursework is preferred.

Project Description: Our research program is part of the Tobacco Center of Regulatory Science (TCORS) at Penn State College of Medicine, and much of our ongoing research is focused on investigating adverse health effects of tobacco use and translating our research findings into scientifically-informed tobacco regulatory policy. In addition to getting introduced to US tobacco regulatory policy, the summer intern will conduct lab-based experiments measuring biomarkers of oxidative stress in a case-control study of lung cancer patients. Data from the project will be informative of differences in oxidative stress biomarker levels between lung cancer cases and controls and will contribute to the understanding of lung cancer and oxidative stress in patients undergoing chemotherapy.

Investigator: Yan Dong, Ph.D.
Institution: University of Pittsburgh
 Pittsburgh, PA
Project Title: Cocaine-Induced Adaptation in NMDA Receptors
Research: Basic Research
Research Area: neural plasticity, addiction, depression
Earliest Start Date: 7/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: science major, highly interested in modern neuroscience

Description: Relapse to drug use during abstinence is a major challenge in the treatment of drug addiction. Both human and animal studies show that relapse is often triggered and precipitated by cues previously associated with drug self-administration. Results from rodent models of drug relapse have implicated synaptic transmission from the basolateral amygdala (BLA) to the nucleus accumbens (NAc) in cue-induced cocaine seeking. The objective of this application is to explore how BLA-to-NAc synaptic transmission is re-organized following cocaine exposure and how this re-organization contributes to cue-induced cocaine seeking. Our published and preliminary results from the last funding period suggest that the BLA-to-NAc afferent undergoes a silent synapse-based re-organization and that interfering with this re-organization attenuates cue-induced cocaine seeking. Silent synapses are thought to be immature excitatory synaptic contacts that contain NMDAR receptors (NMDARs) without stable AMPA receptors (AMPA receptors). By recruiting/stabilizing AMPARs, these immature synapses develop into fully functional synapses, potentially resulting in new neural circuits. Thus, generation and maturation of silent synapses in the adult brain may represent a critical and profound process of synaptic and circuitry re-organization. Based on these and other results, we hypothesize that following cocaine self-administration, nascent silent synapses are generated within the BLA-to-NAc projection, and maturation of these silent synapses critically contributes to cue-induced cocaine seeking. We will test this hypothesis in the following two aims: Aim 1: Characterize cocaine-induced re-organization of BLA-to-NAc synapses We will test the hypothesis that: i) the silent synapse-based synaptic re-organization within the BLA-to-NAc afferent is initiated by the formation of new presynaptic terminals and new postsynaptic partners enriched in NR2B subunit-containing NMDARs; and ii) is completed by postsynaptic insertion of calcium-permeable AMPA receptors. We will use a combination of in vivo viral tools, molecular replacement, optogenetic manipulation, and slice electrophysiology to manipulate key proteins for axonal growth/synaptogenesis, and examine the impact of these manipulations on the generation and maturation of silent synapses within the BLA-to-NAc afferent. Aim 2: Disrupt cocaine-induced re-organization of BLA-to-NAc synapses We will develop in vivo approaches to prevent, disrupt, or reverse cocaine-induced, silent synapse-based re-organization of the BLA-to-NAc afferent, and examine the extent to which these manipulations attenuate cocaine seeking. By accomplishing the proposed experiments, we follow an innovative conceptual angle (synaptic/circuitry re-organization) to understand the neural basis underlying cue-induced cocaine seeking. Several molecular substrates characterized in this study might be targeted experimentally and clinically for attenuating cocaine relapse. As such, this proposal is highly relevant to the mission of NIDA and NIH.

Investigator: Prasun K. Datta, Ph.D.
Institution: Temple University
 Philadelphia, PA
Project Title: Role of Epigenetics in Glutamate Transporter EAAT2 Regulation in NeuroAids
Research: Basic Research
Research Area: Epigenetics, glutamate transporter, EAAT2, NeuroAIDS, miRNA, Astrocyte, histone deacetylase, drug abuse, morphine,
Earliest Start Date: 6/29/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 19

Student Qualifications: Undergraduate students majoring in Biology, Neuroscience, Molecular Biology, Biochemistry, or intend to major in one of these or a related major are preferred. Students must have a GPA above 3.1 and should have basic biology, chemistry, biochemistry laboratory skills, very good IT and communication skills. Students must be interested in drug abuse research and conducting basic research in the field of neuroscience. Students must be punctual, reliable, and hardworking and have the ability to follow instructions. Previous lab experience with handling human cells in culture and mice is a plus. Student must view this as a research opportunity and not as a summer employment opportunity.

Project Description: Research in this laboratory is directed toward understanding the genetic and cellular mechanisms involved in expression of the predominant glutamate transporter EAAT-2 in brain astrocytes in the context of pro-inflammatory cytokines and drugs of abuse such as morphine and cocaine. Using human fetal brain derived astrocytes and the mouse as a model and employing a combination of cutting-edge tools, the lab is currently exploring how epigenetic mechanism(s) modulate the expression of EAAT2 gene. A summer program in this laboratory will enable the student not only to learn basic molecular biology techniques such as cell culture, isolation and culture of astrocytes from mice brains and fetal brains, western blot analysis, real-time PCR but also cutting edge techniques as organotypic brain slice culture and electrophysiology. Trainees are teamed up with postdoctoral researchers to learn specific techniques and basic concepts of epigenetics and neuroscience.

Investigator:	Wenzhe Ho, M.D., M.P.H.
Institution:	Temple University Philadelphia, PA
Project Title:	Opioids, HIV/HCV and Host Cell Innate Immunity
Research:	Transnational Research
Research Area:	Drug abuse, HCV/HIV, Neuro AIDS, Viral Immunology, Innate Immunity
Earliest Start Date:	7/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Prefer to have students with biology major, having a great interest in research (with or without experience, although research experience is preferred). Students should have attributes of paying attention to details, being a good listener, following instructions, getting along with others, and having ability to organize/present data. Students also have excellent communication skill, and are able to read and write in English.

Project Description: Dr. Ho's laboratory is using multidisciplinary approaches to understand virus-host interactions and the basic mechanisms that control virus replication and strategies for enhancing the innate immunity against viral infections, particularly human immunodeficiency virus (HIV) and hepatitis C virus (HCV, a major etiology of liver disease). Working closely with drug abusing populations in the regions of Philadelphia and China, the Ho laboratory is also investigating whether drugs of abuse such as heroin and methamphetamine have a cofactor role in promoting HIV and/or HCV diseases. Since HIV and/or HCV infection are frequently found in injection drug users (IDUs) and these two pathogens are likely to be responsible for the highest infectious disease morbidity and mortality rates among IDUs, Dr. Ho's laboratory is investigating the role of drug abuse in the immunopathogenesis of HIV and/or HCV diseases. Dr. Ho and his research team use in vitro, ex vivo and in vivo models to directly address the question of whether drugs of abuse (opioids and methamphetamine) have the ability to suppress host immune responses and promote HIV and/or HCV diseases. In collaboration with the investigators from the University of Pennsylvania and Wuhan CDC, studies in the Ho's laboratory have shown that drugs of abuse such as opioids and methamphetamine impair antiviral functions of host innate immune cells (natural killer cells and CD56+ natural T cells) and facilitate HIV or HCV infection/replication. Current research in the Ho's laboratory is investigating the specific effects of opioids such as heroin and morphine on type 1 IFN-mediated intracellular immunity that control HIV or HCV infection and replication. In addition, to determine whether drugs of abuse (opioids and methamphetamine) and/or HIV impair the innate immunity in human neurons and compromise the efficacy of HIV treatment (HAART) is also a focus of Dr. Ho's research.

Investigator: Charles P. O'Brien, M.D.
Institution: University of Pennsylvania
 Philadelphia, PA
Project Title: Vietnam Study
Research: Clinical Research
Research Area: Psychiatry-Addictions
Earliest Start Date: 6/1/2015
Housing Available: Yes
Student Level: High School/Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Student should have a connected degree or interest in the behavioral sciences. Can be an interest in medicine or health care. If student is high school age, must be local.

Project Description: The Program is a 10 week, 40 hours a week placement, supervised by a Principal investigator, and a designated program Director. The program will consist of introduction to addiction research including the understanding of clinical protocols and psychopharmacology, and includes the following:

- (1) Psychiatry 105 coursework (Didactics); understanding of the Diagnosis and Treatment of Substance Abuse
- (2) Participation in science meetings
 - Weekly Speaker Sessions hosted by various investigators from the field and within the University
- (3) Data collection activities & data analysis
 - Active research study preparation, including CRF work and Assessments
 - (may include patient contact)
- (4) Laboratory experience/experiments (optional)
 - includes animal research
- (5) Library research
- (6) Group activities
 - includes mentor meetings and other group activities
- (7) Final Oral Presentations on topics or studies covered during the internship

Investigator:	Carmen Albizu-Garrcia, M.D.
Institution:	University of Puerto Rico Medical Sciences Campus San Juan, PR
Project Title:	Diversity-promoting Institutions Drug Abuse Research Program (DIDARP)
Research:	Drug Development Research
Research Area:	Drug abuse, stigma, SUD, vulnerable populations, ADHD
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: The student must have skills in database searches, literature reviews and basic knowledge in qualitative research methodology.

Project Description: Our work under DIDARP centers on developing methodology and theory to address moderators of treatment for substance use disorders (SUD) in Latinos under criminal justice supervision, a population in which SUD is over represented, in two important topics: the role of stigma and the contributions of the ADHD spectrum to entry, retention, and treatment outcomes. We are also addressing the normative influences on stigma towards drug users, that is how the stigmatized identity is constructed in society with emphasis on the role of printed media.

We will be integrating our summer intern to our stigma project. The student will be involved in the progress phase of a qualitative content analysis study of mass media portrayal of illicit drugs, drug users, and drug treatment in PR newspapers. The intern will be supported by a Psychology doctoral student, who is currently carrying out the content analysis study. He/she will also get the support of the library staff, the educational component of our program and mine as the project's PI as well. He/she will participate in workshops and seminars conducted throughout an eight week tenure in the program. As a culminating experience, he/she will make a presentation to the DIDARP research group about the experience and findings as well of the implications of these findings in public health and society.

The student will acquire: (1) Knowledge on how stigmatized identities are constructed and the implications for policy and drug treatment services. (2) Understanding of qualitative methodology and its contributions to the knowledge base in the field. (3) Beginner skills in content analysis, data extraction, use of ATLAS.ti software, literature searches in bibliographic databases, data synthesis, and data presentation. (4) Appreciation of the stages in development of research competencies and how this may inform her long-term academic goals.

Investigator: Arthur Riegel, Ph.D.
Institution: Medical University of South Carolina (MUSC)
Charleston, SC
Project Title: Relapse to cocaine-seeking: Cellular adaptations in the VTA
Research: Basic Research
Research Area: Addiction, cocaine, stress, DREADDs, optogenetics, drug self-administration; relapse, behavior, immunocytochemistry
Earliest Start Date: 6/15/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Candidates should be highly motivated with 2-4 years of relevant undergraduate coursework. Students will be expected to work with rodents (rats and mice) in the context of behavioral testing. Preference would be given to individuals with prior exposure to techniques such as optogenetics, designer receptors exclusively activated by designer drugs (DREADDs) or operant training in behavioral paradigms, but all interested students are encouraged to apply.

Project Description: Our laboratory in the MUSC Department of Neurosciences in Charleston SC brings together a large group of expert neuropharmacological researchers and a range of laboratory facilities to create outstanding opportunities for young people interested in a research career in the neurosciences of addiction. We are seeking an intern to assist with characterizing the expression and efficacy of novel genetic tools in operant behavioral tests to determine mechanisms responsible for relapse to drug seeking. Areas of focus include stress and environmental cues.

Investigator: Russell W. Brown, Ph.D.
Institution: East Tennessee State University
Johnson City, TN
Project Title: Nicotine and the roles of nicotinic receptors in a rodent model of schizophrenia
Research: Basic Research
Research Area: Behavioral Pharmacology/Behavioral Neuroscience
Earliest Start Date: 5/15/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Most importantly, I need students to be motivated to learn about neuroscience research. It would be advantageous if the student has learned how to inject animals has done some behavioral testing and knows generally about preclinical research. However, it's not an absolute requirement. We're a friendly group, and we all work as part of a team. I need the student to be willing to join in as part of a team instead of acting alone.

Project Description: In past work, our laboratory has analyzed the behavioral and neurochemical consequences of dopamine D2-like receptor supersensitization, and its relevance to schizophrenia. Dopamine is a neurotransmitter involved motor function and reward, and it binds to two families of receptors: The D1 and D2. Through early developmental administration of the drug quinpirole, which acts as an agonist to dopamine D2 receptors, the dopamine D2 receptor is increased in its sensitivity. This increase in sensitivity does not result in a change in receptor number, and persists throughout the animal's lifetime. Over several years of work, we have found that neonatal quinpirole treatment enhances behavioral sensitization and rewarding effects of nicotine. This is especially important because approximately 80% of schizophrenics smoke cigarettes, and they smoke heavily. Ultimately, this results in a poor quality of life and shortens the average lifespan in a smoking schizophrenic. Our primary interest here is to try to identify behavioral and neurobiological targets for treating smoking in schizophrenia. In a second line of research, we have been investigating the effects of methylphenidate (trade name: Ritalin) on behaviors related to addiction. We are also analyzing the effects of methylphenidate on brain plasticity, and currently are analyzing whether methylphenidate enhances the behavioral responses to nicotine in adolescent rats.

Investigator:	Lane Strathearn, M.D.
Institution:	Baylor College of Medicine Houston, TX
Project Title:	Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers
Research:	Clinical Research
Research Area:	Maternal, Oxytocin, Dopamine, Reward, Mother-Infant, Functional MRI
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	High School/Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Previous research experience is not required. However, the student should be interested in developing his or her own research interest and to have a true research experience. They will not be working with animals but only human research. College students can major in any area of science, psychology or neuroscience.

Project Description: Maternal drug addiction constitutes a major public health problem for both women and affected children, with long lasting consequences on children's social, emotional and cognitive development. Current treatment strategies tend to focus on the mother and her current addiction, rather than her relationship with her child, and developmental processes that may perpetuate the addiction problems, such as unresolved childhood attachment trauma, neglect, and chronic stress. Unlike mothers who find engaging with their own infant to be a uniquely rewarding experience, mothers with addictions may be less able to respond appropriately to their infant's cues, finding them less intrinsically rewarding or salient, and more stress provoking. Oxytocin, a neuropeptide with decreased peripheral levels seen in addicted mothers, is integrally involved in maternal brain and behavioral responses and may reduce some of these negative effects. The Attachment and Neurodevelopment Lab at Baylor College of Medicine is conducting a randomized, placebo-controlled study of intranasal oxytocin on maternal brain responses. We will use functional MRI to examine how oxytocin affects the response of drug-exposed mothers to seeing their infant's face cues. Summer students will assist in enrolling mothers and their babies through a residential drug treatment facility, conducting interviews and videotaping mother-infant interaction. Infant face images are collected and edited for presentation within the functional MRI brain scanner during a subsequent visit. Students will be involved in running mother-baby study visits, videotaping mother-infant interactions, preparing baby face images and recorded cries for presentation in the brain scanner, and preprocessing brain imaging data. The Attachment and Neurodevelopment Lab consists of a post-doctoral fellow, graduate students and other undergraduate or high school students who work together in preparing and conducting each research visit. For those interested, there will also be opportunities to conduct basic statistical and brain imaging analyses.

Investigator: Masako Isokawa, Ph.D.
Institution: The University of Texas Brownsville
Brownsville, TX
Project Title: Cannabinoid mobilization in neurons
Research: Basic Research
Research Area: Neuronal mechanisms for the production of endogenous cannabinoids
in the central nervous system
Earliest Start Date: 6/10/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: My research will require students to work with brain tissue samples. Although no previous research experience is required, the interns should have an interest in basic neuroscience and willingness to learn new techniques that are to be used in the project. Students who are planning to go to medical school or graduate school in neuroscience preferred.

Project Description: My lab investigates the role of the brain ghrelin receptor as an intrinsic molecule for the production of endogenous cannabinoids. Endogenous cannabinoids are produced in both excitatory and inhibitory neurons in the brain. A research project in the summer 2015 will be to focus on the production of endogenous cannabinoid in the inhibitory neuron. Thus, we will be investigating the localization of the ghrelin receptor in the inhibitory neurons in the hippocampus and determine its role on the production of endogenous cannabinoid. Immunohistochemical methods will be used to identify the location of the ghrelin receptor and confocal imaging technique will be used for data analysis.

Investigator: Ashley Acheson, Ph.D.
Institution: The University of Texas Health Science Center at San Antonio
San Antonio, TX
Project Title: Relating brain maturation to impulse control and substance use
development
Research: Human Research
Research Area: Brain Development, Substance Abuse, Impulsivity, Adolescent
Earliest Start Date: 5/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: Someone who would works well with others especially adolescents, computer literate, and has an interest to learn about human research.

Project Description: Adolescent substance use is common and associated with both significant negative individual consequences and substantial costs to society. The purpose of this study is to identify neurobiological mechanisms underlying risks for, and consequences of, adolescent substance use. Tests will be conducted in adolescents (11 to 14 years old) with high and low familial risk for substance use disorders, selected from a larger ongoing longitudinal study that is testing causal relationships between the development of impulse control and substance use. We seek to identify relationships between maturation of frontostriatal circuitry, impulse control development, and progression of substance use involvement across adolescence. We will compare circuitry between adolescents at high or low risk for substance use disorders (based on family history) before regular drug use begins; determine how individual differences in early adolescent frontostriatal circuitry development, before regular drug use, predict onset and severity of substance use; and examine how trajectories of frontostriatal circuitry development are affected by both familial risk and adolescent substance use. We posit that impulse reward-focused behaviors emerging during adolescence are driven, at least in part, by inadequate regulation of the striatum due to delayed maturation of the prefrontal cortex, and substance abuse to advance understanding of risks and consequences of adolescent substance use. This project integrates distinct bodies of research on brain development, adolescent behavior, and substance abuse to advance understanding of risks and consequences of adolescent substance use. As part of this project, our student intern will be involved with daily data collection, preliminary data analysis, and guided readings. The intern will participate in data collection by attending imaging sessions with participants and administering behavioral tasks during the scans. The intern will also contribute to data analyses testing study aims. The student will also participate in guided readings with faculty on neurobiology, neuroimaging techniques, substance use disorder initiation and development, impulsivity, and relevant mental disorders. This proposal integrates distinct bodies of research on brain development, adolescent behavior, and substance abuse to advance understanding of risks and consequences of adolescent substance use. This work has important implications for advancing knowledge, and ultimately may contribute to more effective treatment and prevention strategies for adolescent substance use disorders.

Investigator: Laura O'Dell, Ph.D.
Institution: University of Texas at El Paso
El Paso, TX
Project Title: Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal
Research: Basic Research
Research Area: Neuroscience; Drug Abuse; Tobacco use; Addiction; In Vivo Micro Dialysis; Behavior; Molecular Biology
Earliest Start Date: 5/8/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: Biology or Chemistry Background; Physiological Psychology; Animal Handling experience.

Project Description: Our summer student will work in my laboratory as part of our Research Experience for Undergraduates (REU) program entitled, "SMART: Minds." Students will focus on studies related to the parent grant ("Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal"- DA021274). The projects will examine developmental differences to the behavioral effects produced by nicotine and withdrawal from this drug in male and female rats. They will learn to use place-conditioning procedures to assess the rewarding and aversive effects of nicotine across these groups. The student will present their work at the end of the summer at the local College Office of Undergraduate Research (COURI) Annual Undergraduate Research Symposium. The student will also be involved in studies comparing the rewarding effects of nicotine in adolescent, adult, and adult animals that were exposed to nicotine during adolescence using self-administration procedures. This project is directly from the parent grant and is will also be completed this summer. The students will be heavily involved in the data collection of this project and will learn valuable presentation skills. As part of the summer REU they will also receive training in bioethics and other professional skills. These projects are important for the overall hypotheses in the parent grant, and publication of this work will also the students to also improve their writing skills. As a Hispanic female, I am particularly dedicated to the success of a diverse range of students and I look forward to continue mentoring students through this valuable NIDA program.

Investigator: Kathryn Cunningham, Ph.D.
Institution: University of Texas Medical Branch
Galveston, TX
Project Title: Inhibitors of 5-HT₂CR Protein-Protein Interactions
Research: Basic Research
Research Area: Addiction Research; Addiction Sciences; Pharmacology; Toxicology;
Neuroscience
Earliest Start Date: 6/8/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Excitement about science; team player; preferred background in Neuroscience, Psychology, Pharmacology, or Behavioral Science; Understanding of the importance of animal research to advancing our understanding of addiction; Wants to visit the Lone Star State and loves the beach!

Project Description: The project's goals are to uncover the mechanisms underlying drug-seeking behavior to characterize the bio molecular profile of addiction and uncover the path to designing new diagnostic and therapeutic approaches to addiction. Example questions: I. How does impulsivity cause vulnerability to addiction and relapse? The lab is designing, synthesizing and evaluating new medication candidates for suppressing these vulnerabilities. II. Can environmental enrichment provide molecular and behavioral protection against vulnerability to addiction and/or relapse? III. How can we improve diagnosis and treatment in addiction? The lab is using RNA microarray technologies to identify a blood biomarker panel for early and late cocaine and methamphetamine self-administration and early and late withdrawal. Once there is a biomarker panel, the lab will work with a company to develop diagnostic tests. The following methods will be employed: A. Observations of rodent behavior, locomotor activity, stereotypy, serotonin syndrome; B. Operant behavior, especially rat drug self-administration and reinstatement models; C. Virally-mediated gene transfer technologies; D. Protein biochemistry and mass spectrometry; E. RNA expression and quantification; and F. Drug discovery, design, synthesis and validation in cellular and behavioral models of new chemical moieties for addiction.

Investigator:	Jia Zhou, Ph.D.
Institution:	University of Texas Medical Branch Galveston, TX
Project Title:	Synthetic Nanofiber Vaccines for Cocaine Addiction
Research:	Drug Development Research
Research Area:	Cocaine addiction, drug abuse, chemical biology, medicinal chemistry, small molecules, haptens, 5-HT _{2C} receptor, GPCR, allosteric modulators, drug discovery, translational research, chemistry
Earliest Start Date:	6/1/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Previous research experience is not required. College students that have taken chemistry courses, have a safety sense of handling chemicals, and are interested in chemical biology, medicinal chemistry, and small molecule drug discovery are encouraged to apply.

Project Description: Our research interests are broadly based on the interface of synthetic organic chemistry and medicinal chemistry, and in particular on the drug discovery of bioactive molecules to probe biological systems or act as potential therapeutic agents in neuroscience and drug addiction. With this general idea in mind, and in active collaboration with other biologists and pharmacologists, we would like to establish a strong and creative research program that applies state-of-the-art chemical approaches to biological problems impacting diagnosis, prevention and treatment of human diseases. One of our current efforts is focused on design and synthesis of small molecules for probing function and development of pharmacological tools for understanding the workings of the brain and that of novel therapies for central nervous system (CNS) disorders such as drug abuse and addiction, depression, schizophrenia, pain, and neurodegenerative diseases. The proposed projects in this area include the identification, characterization and optimization of allosteric modulators, bitopic ligands, and inverse agonists of 5-HT_{2C} receptor, neuromedin U receptor 2 (NMUR2) ligands for eating behavioral disorders, as well as AMPA receptor positive allosteric modulators for preventing neuroapoptosis. In the current project, The goals are to design and develop cocaine vaccines based on designed cocaine analogs in combination with a peptide nanofiber-based delivery platform for eliciting high titers of anti-cocaine antibodies and test their efficacy in a mouse motor activity assay. The work is divided into two aims: Aim 1) Design and synthesis of self-assembling peptide nanofiber-based cocaine vaccines. Aim 2) Test the efficacy of peptide nanofiber cocaine vaccine formulations in a mouse model. Our approach will be to design and chemically synthesize peptide nanofiber vaccines against cocaine.

Investigator: Carlos Paladini, Ph.D.
Institution: University of Texas San Antonio
San Antonio, TX
Project Title: The Synaptic Origin of Reward Prediction Error Signal in Dopaminergic Neurons
Research: Basic Research
Research Area: Dopamine, Addiction, Drug Abuse, Reward Circuitry, Brain
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: No prior experience is required. The lab does use animals in experiments, so the student should be comfortable seeing animals euthanized and handling tissue.

Project Description: The dopaminergic (DA) neurons of the ventral mesencephalon are part of a pathway that regulates reward-seeking behaviors and are the principal cells affected in Parkinson's Disease and addiction. Many drugs of abuse exert dysregulating effects on levels of dopamine and other neurotransmitters, resulting in widespread effects on DA neuron firing pattern. Psychostimulants (e.g., cocaine and amphetamine) alter interactions among multiple receptor subtypes that are co-expressed on DA neurons. Changes in DA neuron activity secondary to altered receptor interactions may underlie many of the behavioral changes associated with drug addiction independently of natural reward seeking mechanisms like feeding.

The dopaminergic neurons of the ventral tegmental area and substantia nigra pars compacta, located within the ventral mesencephalon, encode perhaps one of the most important signals for reinforcement learning in the brain: reward prediction error. This signal is encoded by the firing pattern of dopaminergic neurons, which controls the release of dopamine at target regions. Specifically, transient, impulse-dependent release of dopamine, driven by bursts of action potentials, is critical for natural processing in the brain. Just as critical, pauses in dopaminergic cell activity have opposite psychological meaning for reward information coding and are thought to signal the absence of an expected reward. Identification of the input pathways responsible for bursts and pauses is a key step in understanding the mechanism of reinforcement learning, but has so far proven elusive. This is largely due to the difficulty in accurately duplicating bursts and pauses under controlled experimental conditions such as those attainable during *in vitro* experiments. A second difficulty has been the inability to selectively activate identified afferents to dopaminergic neurons during controlled *in vitro* experiments.

The specific aims in this proposal are designed to investigate the synaptic mechanisms by which specific identified afferents induce bursts and pauses, and how psychostimulants and alcohol alter the input from those same afferents. We will also investigate the potential for synergy when drugs are administered simultaneously. This will identify the circuit basis and synaptic origin of the reward prediction error signal, and provide a mechanistic understanding of how drugs of abuse alter the reward prediction error signal. To achieve this, we will use recordings in conductance-clamp, where specific conductances can be imposed in a defined manner directly on dopaminergic neurons, along with selective *in vitro* stimulation of specific afferents following prior viral infection *in vivo* with channelrhodopsin (ChR2).

Investigator: E. Sherwood Brown, M.D., Ph.D.
Institution: University of Texas Southwestern Medical Center
Dallas, TX
Project Title: Attenuation of Corticosteroid-Induced Hippocampal Changes
Research: Clinical Research
Research Area: stress, memory, hippocampus, corticosteroid, cortisol
Earliest Start Date: 5/11/2015
Housing Available: No
Student Level: High School/Undergraduate
Minimum Age Requirement: 16

Student Qualifications: Motivated; Interested in the brain; Like to find things out
No work with animals is required.

Project Description: Corticosteroid excess is associated with changes in memory and hippocampal structure. A consistent finding during corticosteroid exposure or following stress is a decline in performance on declarative memory tasks (e.g., word lists, paragraph recall). Impairment in declarative memory and hippocampal atrophy have been reported in patients with corticosteroid excess due to Cushing's disease, and, by our group, in medically ill patients receiving prescription corticosteroid therapy. These findings have important implications for patients with mood and addictive disorders, disorders, as a subset of people with these conditions have elevated cortisol. In animal models, hippocampal changes secondary to corticosteroids can be attenuated with agents that modulate excitatory amino acids. Histological changes in animals can be prevented with glutamate release inhibitors or N-methyl-D-aspartate (NMDA) receptor antagonists.

Our group has developed a research program using patients in medical settings receiving prescription corticosteroid (e.g., prednisone) therapy as a model system to explore the effects of cortisol elevations on the human brain. This is also a large and clinically important patient population that frequently has memory impairment as well as mood symptoms related to corticosteroid therapy. Our group has reported depressive symptomatology, deficits in declarative memory, changes in N-acetyl aspartate (NAA, a marker of neuronal viability), and reduction in hippocampal volume during chronic exposure to prednisone. Our group conducted a placebo-controlled proof-of-concept study of the NMDA receptor antagonist memantine in corticosteroid-treated patients and found statistically significant improvement in declarative memory. Our group is conducting a randomized, double-blind, placebo-controlled crossover trial of memantine in 50 outpatients receiving chronic oral chronic corticosteroid therapy. It is hypothesized that the group receiving memantine will show improvement in declarative memory (primary outcome measure) relative to the placebo group. Structural MRI and 1HMRS will be obtained to examine changes in hippocampal and amygdalar volumes and levels of NAA and glutamate.

Investigator: Ginger Lockhart, Ph.D.
Institution: Utah State University
Logan, UT
Project Title: Biobehavioral Processes of Impulsivity
Research: Basic Research
Research Area: Prevention Science
Earliest Start Date: 6/1/2015
Housing Available: No
Student Level: Undergraduate
Minimum Age Requirement: 18

Student Qualifications: This position requires attention to detail, a positive attitude, and excellent interpersonal skills.

Project Description: The purpose of this study is to investigate the hormonal basis underlying impulsivity. Impulsivity is important to study because it is implicated in a wide range of risk behaviors, including substance use. This project is driven by three major questions: 1) To which extent is the process of health-related decision making associated with biomarkers of young adults' stress reactivity? 2) What are the psychosocial factors that contribute to dysregulation of their stress hormonal systems? 3) To which extent does hormonal dysregulation predict negative health behavioral? The project consists of a lab-based component, in which 50 young adults will participate in a decision-making task designed to measure their impulsivity. Before and after the task, the participants will supply saliva samples, which will be tested for two stress-related hormones (cortisol and alpha-amylase) and nerve growth factor, a protein implicated in managing stress responses. Under the supervision of the PI and predoctoral research fellows at the Prevention Science Laboratory, interns will receive training in salivary data collection techniques and computer-based impulsivity tasks. Interns will participate in all aspects of the study, including lab meetings, department colloquia, and professional development activities with the Principal Investigator.

Investigator:	June Tangney, Ph.D.
Institution:	George Mason University Fairfax VA
Project Title:	Jail-Based Treatment to Reduce Substance Abuse, Recidivism and Risky Behavior
Research:	Clinical Research
Research Area:	Substance Dependence, HIV risk, recidivism, jail inmates, shame and guilt
Earliest Start Date:	5/18/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Successful interns have the ability to manage multiple tasks and strong attention to detail. Interns must pass a criminal background check prior to beginning the internship. Prior research experience is a plus.

Project Description: This project imports social-personality theory and research on moral emotions and cognitions to the applied problems of crime, substance abuse, and HIV risk behavior. The primary aims are to better understand the role of moral emotions (i.e., shame, guilt and empathy) and moral cognitions (i.e., criminogenic beliefs) in the lives of currently and recently incarcerated offenders, and to develop effective culturally sensitive jail-based interventions targeting these theoretically specified mechanisms of actions (MOAs) to reduce post-release substance use, HIV risk, and recidivism and to enhance offenders' reintegration into the community. This summer, we will:

- (1) Continue 1, 4, 7, and 10 year post-release interviews for Study 1, a basic research prospective study of moral emotions and cognitions of 508 serious offenders who were first assessed shortly upon entry to a county jail;
- (2) Continue Study 2, a Phase II Randomized Clinical Trial (RCT) of the restorative justice-inspired Impact of Crime (IOC) group intervention of 200 jail inmates nearing release into the community, focusing on moral emotions and cognitions as MOAs, including longitudinal follow-up at 3 months, 1 year, and 3 years post-release;
- (3) Pilot test novel brief interventions to enhance awareness and reduce post-release substance misuse and HIV risk behavior

The NIDA intern will obtain research and clinically-relevant training to assist in gathering data using touch-screen computers and conducting face-to-face interviews with jail inmates, as well as conducting post-release follow-up interviews by phone. The intern will assist in gathering official records from the jail, and in coding and entering the data for analysis. The intern will be supervised in developing a testable research question informed by the theoretical and empirical literature, in testing out the research question using appropriate statistical procedures via SPSS and/or Mplus drawing on existing Study 1 data, and in writing up the results in a format suitable for presentation at a national conference and/or publication in a peer-reviewed journal.

Investigator: Faye Taxman, Ph.D.
Institution: George Mason University
Fairfax VA
Project Title: In-Person Motivational Interviewing (MI) vs. a Motivational Computer Program (MC) for Probationers
Research: Clinical Research
Research Area: Motivation to change, motivational interviewing, experiment, risky behaviors
Earliest Start Date: 5/26/2015
Housing Available: Yes
Student Level: Undergraduate
Minimum Age Requirement: None Listed

Student Qualifications: The student should be familiar with office products and preferably SPSS or STATA. The student will need to work on various computer data sets with a team of researchers. Some field work may be required including going to the probation office.

Project Description: The student will be involved in coding fidelity tapes and timeline follow-back data collected on 400 probationers. The study is an experiment comparing motivational interviewing conducted by a counselor or a web-based programming on drug use, treatment initiation, and probation outcomes. Subjects are interviewed at baseline, 2 months and 6 month follow-up.

Investigator:	Chenming Zhang, Ph.D.
Institution:	Virginia Tech Blacksburg, VA
Project Title:	Novel nanovaccines against nicotine addiction
Research:	Drug Development Research
Research Area:	Vaccine, nanoparticle, nicotine, nicotine vaccine, biomolecules, biotechnology, nanotechnology
Earliest Start Date:	5/25/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: An ideal student will have background knowledge in chemistry and biochemistry and at least is enrolled in a university as an undergraduate. Since we conduct experiment based research, the student needs to be hands-on and is good at learning new experimental techniques. To gain the most through this summer research program, a student with previous research experience is preferred but not required.

Project Description: Smoking is a growing global problem. Chronic use of tobacco is considered a responsible factor for serious diseases such as chronic obstructive pulmonary disease, stroke, chronic lung disease, and cancer. There are more than 60 million smokers in the U.S alone. Despite the urgent need, finding ways to combat the problem has been a constant challenge to the society and the medical field. Current pharmacological therapies have shown very limited success with some serious side-effects, such as depression with suicidal behavior. On the other hand, immunopharmacotherapy or vaccination has emerged as a promising alternative. However, all current vaccines have shown limited efficacy, and thus there is undoubtedly a strong need for improved nicotine vaccines.

In this project, nanoparticle based novel nanovaccines against nicotine will be prepared. The research will involve expression and purification of recombinant proteins as potential carrier proteins for nicotine hapten, conjugating haptens to carrier proteins and other biomolecules, preparation of nanoparticles, assembly of nanovaccines, and conducting animal studies. We expect that, through successfully executing the carefully designed experiments, we will be able to identify a leading vaccine candidate that will show unprecedentedly high antibody titers against nicotine and can be advanced into clinical trials.

Investigator:	Anne Duer, M.D., Ph.D., M.P.H.
Institution:	Fred Hutchinson Cancer Research Center Seattle WA
Project Title:	Evaluating the role of alcohol and substance use on HIV transmission among MSM using viral sequence analysis
Research:	Epidemiology Research
Research Area:	Alcohol Use Disorder, Cocaine use, HIV transmission, Men who have sex with men, Peru
Earliest Start Date:	6/1/2015
Housing Available:	No
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Undergraduate students interested in medicine, science or public health: the project includes molecular biology and bioinformatics, and analysis of the role of alcohol/substance use in HIV transmission. Prior laboratory experience is required and experience in molecular biology is desired. The student will use human blood samples to derive and sequence HIV viral templates, and will be mentored in phylogenetic & epidemiologic analyses. No contact with study participants or laboratory animals.

Project Description: Drug and alcohol abuse among North and South American men who have sex with men (MSM) are associated with increased risk of acquiring and transmitting HIV. In Peru, where there is a concentrated HIV epidemic among MSM and transgender women (TW), a 2011 survey of 5,148 gay and bisexual men in 5 cities reported alcohol use disorder in 63% of respondents, five times higher than that reported by males in the general Peruvian population. We hypothesize that this high-level alcohol use as well as drug use foster onward HIV transmission by increasing sexual risk behavior, such as unprotected intercourse, and by decreasing adherence to antiretroviral therapy among HIV-infected MSM and TW. Our research program in Lima is investigating the impact of drug and alcohol use on HIV transmission in a cohort of over 1,400 MSM and TW who are tested monthly for HIV. We collect data on alcohol and drug use at each monthly visit. Our hypothesis is that participants who report alcohol and substance use are more likely to transmit to new partners; thus HIV sequences from these individuals should be most likely to 'spread'. Linked transmissions will be identified through computational analysis of viral sequences in blood specimens from newly diagnosed HIV-infected cohort participants and their HIV-infected (HIV+) partners (using established techniques in the laboratory of Dr. James Mullins).

During this summer research project, the student will: 1) Identify HIV transmission clusters through viral sequence analysis in blood from HIV+ study participants. A phylogenetic tree containing clusters of nearly identical viral sequences and unclustered sequences will be constructed for all acutely infected index cases and their HIV+ recent sexual contacts. These clusters are due to high-level transmission which occurs early after infection, when HIV viral load is high and before sequence divergence in an infected individual. 2) Investigate whether alcohol and substance use increases high-level onward transmission by 'mapping' substance use to transmission clusters. This analysis will compare the sexual behaviors, and use of alcohol or drugs such as cocaine between MSM clustered by phylogeny and MSM not clustered by phylogeny. For example, we anticipate that roughly 2% of MSM/TW with newly diagnosed HIV will use cocaine and roughly 35% will abuse alcohol – this analysis will assess whether either cocaine use or alcohol abuse are enriched among men in transmission clusters.

Investigator:	Jashvant Unadkat, Ph.D.
Institution:	University of Washington Seattle, WA
Project Title:	Mechanisms of Drug Disposition during Pregnancy
Research:	Basic Research
Research Area:	Pharmacokinetics of drugs, Pregnancy, maternal-fetal exposure to drugs, mechanisms of changes in pharmacokinetics, PBPK modeling and simulations
Earliest Start Date:	6/22/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: Students who will best fit as interns will be those who have some laboratory research experience and do not have objections to working with animals or animal/human tissues. Students should be enrolled in four year college and should be sophomores, juniors or seniors majoring in a biological science or engineering.

Project Description: This program project will study the mechanisms of disposition of drugs of abuse and those used to treat abuse during pregnancy. Human, animal and in vitro studies in cells will address the aims stated in each of the three projects. A physiological model will also be created to predict the disposition of these drugs in the human maternal-fetal unit. A student who is interested in working on this project will be involved in research conducted by any one of the three projects of this grant.

Project 1: This project will systematically investigate hepatic metabolism (e.g. buprenorphine) and placental transport (e.g. norbuprenorphine, methadone, and bupropion) of drugs that are commonly used to treat pregnant women who abuse drugs. Despite their clinical importance in the treatment of drug abuse of pregnant women, very little is known about the metabolism and placental transport of these drugs during pregnancy, and thus clinical data about changes in the pharmacokinetics (PK) or fetal exposure of these drugs are scarce.

Project 2: The use of amphetamines and amphetamine derivatives, such as MDMA (Ecstasy) and methamphetamine (crystal meth) during pregnancy increases the risk of pregnancy complications and is associated with long-term adverse effects on exposed children. Many of the amphetamines (e.g. MDMA, methamphetamine) abused by pregnant women are cleared from the maternal circulation primarily by the hepatic P450 enzyme CYP2D6. These drugs are also known to interact with renal, hepatic and placental organic cation and monoamine transporters including organic cation transporters 1-3 (OCT1-3), the norepinephrine transporter (NET) and the serotonin transporter (SERT). This project aims to characterize the gestational age-dependent changes in maternal and fetal exposure to amphetamines and elucidate the mechanisms underlying these changes.

Project 3: This project will study the disposition of bupropion, through the three trimesters. Bupropion is used for smoking cessation and to treat methamphetamine abuse (bupropion). Through these studies, we will determine the change in activity of CYP2B6 throughout pregnancy. This project, together with projects 1 and 2, will collect data on the change in activities of drug metabolizing enzymes (CYP3A, 2D6, 2B6) and transporters (OCT, NERT, SERT, P-gp and BCRP) throughout pregnancy.

Investigator:	Paul Gasser, Ph.D.
Institution:	Marquette University Milwaukee, WI
Project Title:	Glucocorticoid regulation of dopamine clearance, cocaine seeking, and reward
Research:	Basic Research
Research Area:	Addiction, motivation, reward, cocaine, stress, corticosterone, rat, relapse, dopamine, nucleus accumbens, preclinical
Earliest Start Date:	5/26/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Qualified students will be college students entering the sophomore, junior or senior year who have a strong interest in neuroscience and who are pursuing a degree in a biology-, neuroscience-, or psychology related field. Prior research experience is preferred but not required. Students must be willing to work with animals (rats and mice).

Project Description: The full-time 10-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. Paul Gasser at Marquette University in Milwaukee, WI and participation in the Marquette University College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The student's project will involve the use of preclinical rat models to investigate the neurobiological processes through which stressful stimuli can modulate motivation and reward processes and promote relapse to drug use. Specifically, mechanisms by which the stress hormone corticosterone modulates dopaminergic neurotransmission in the nucleus accumbens will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection mini-course. At the end of the 10-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.

Investigator:	John Mantsch, Ph.D.
Institution:	Marquette University Milwaukee, WI
Project Title:	Glucocorticoid-regulated endocannabinoids and stress-potentiated cocaine seeking
Research:	Basic Research
Research Area:	Addiction, Cocaine, Stress, Corticosterone, Rat, Relapse, Endocannabinoid, PrefrontalCortex, Preclinical
Earliest Start Date:	5/26/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	None Listed

Student Qualifications: Qualified students will be rising college sophomores, juniors or seniors with a strong interest in neuroscience and who are pursuing a degree in a biology-, neuroscience-, or psychology related field. Prior research experience is preferred but not required. Students must be willing to work with animals (rats and mice).

Project Description: The full-time 10-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. John Mantsch at Marquette University in Milwaukee, WI and participation in the Marquette College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The mentored project will involve the use of preclinical rat and mouse models to investigate the neurobiological processes through which stressful stimuli can promote relapse to drug use. More specifically, mechanisms in the prelimbic prefrontal cortex the control drug use during periods of stress will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection mini-course. At the end of the 10-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.

Investigator:	Christopher Olsen, Ph.D.
Institution:	Medical College of Wisconsin Milwaukee, WI
Project Title:	Mild TBI: Effects on addiction-related phenotypes and mesocorticolimbic function
Research:	Basic Research
Research Area:	Addiction, Cocaine, Concussion, Traumatic Brain Injury
Earliest Start Date:	5/25/2015
Housing Available:	Yes
Student Level:	Undergraduate
Minimum Age Requirement:	18

Student Qualifications: The primary qualifications are motivation, desire to learn, and patience. The student should have an interest in neuroscience, and a background in biology is desirable. Because our laboratory uses controlled substances, the student may not have been convicted of a felony and may be subject to a drug test at any time while working in the lab.

The student should feel comfortable with working with live rats (we will provide extensive training in animal handling), learning to conduct surgical procedures (a permanent catheter is implanted into the jugular vein under anesthesia to allow for daily access to intravenous drug), and working with fresh or preserved tissue (e.g., brain).

Project Description: Our collaborators (biomedical engineers) have previously developed and validated a mild blast brain injury model in rats. This model is meant to simulate mild blast injury that is frequently encountered by military personnel, and also to be a model for concussion in general. In this model, an air blast is delivered to anesthetized rats, which leads to brain injury in areas of the brain that are implicated in addiction, a common feature in human brain injury as well. This is a study to determine if the mild blast injury will alter cocaine self-administration and subsequent drug seeking in rats that have not had prior exposure to the drug.